SOUL OF THINGS;

OR,

PSYCHOMETRIC RESEARCHES AND DISCOVERIES.

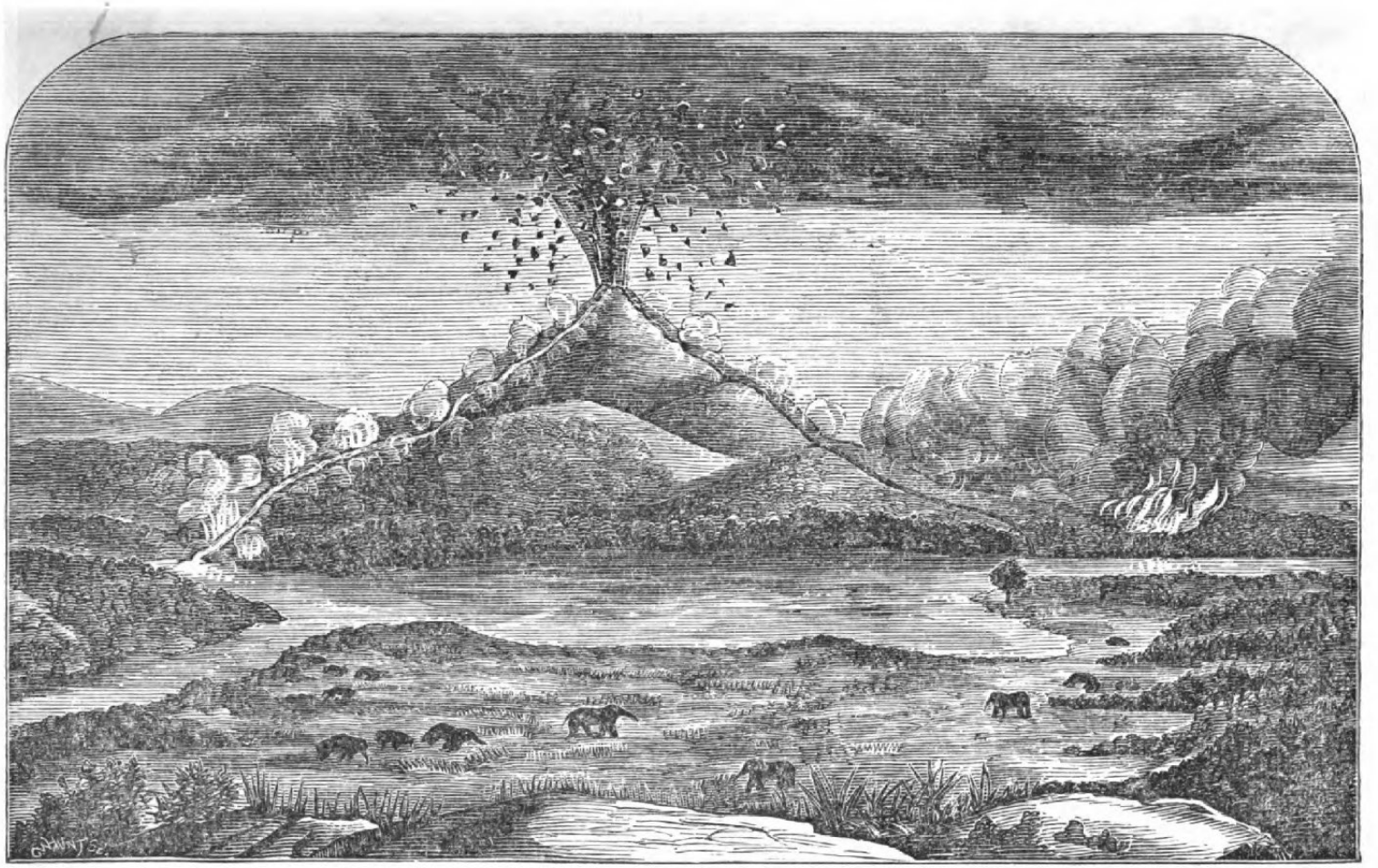
BY WILLIAM DENTON.

VOL. II.

BOSTON:
PUBLISHED BY WILLIAM DENTON.
1873.

SEP 29 1899

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FRONTISPIECE. — Eruption of an Ancient Volcano in California.

PREFACE.

In a previous volume of "The Soul of Things," Mrs. Denton and I have recorded many psychometric experiments and their results, and given our ideas of the causes which operate to produce such results. We did not anticipate, nor indeed desire, that the marvellous revelations recorded in that volume should, without examination, be accepted as truth. They were the result of explorations in a domain hithertoo so little investigated, that doubts of even its existence is the prevailing condition of the human mind; and it is easier by far to believe in the dishonesty, or at least the self-deception, of those making the statements, than to credit the marvels that they relate. A consideration of this did not prevent the issue of the previous volume; and I see no reason why it should prevent the issue of the present. Eventually the attention of scientists must be directed to what I conceive to be the most interesting and important realm ever investigated by the spirit of man, because that in which the greatest results can be most readily obtained. All the past is really ours, and may be used for our benefit; the present is greater, better, more beautiful and perfect, than we ever dared to dream; nor does it seem unreasonable to think that the future will be all that the most sanguine can desire.

WILLIAM DENTON.

Wellesley, July 10, 1873.

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THE SOUL OF THINGS.

CHAPTER I.

THE SOUL AND THE SOUL-REALM.

When the Marianne Islands were discovered, it was found that the inhabitants had supposed that their islands were the only land, and they the only people, in the world.

Surrounded by an apparently boundless ocean, for a long period of time they had looked out, and beheld nothing but the little volcanic islets that constituted their earthly all; had seen no other faces than the grimy countenances of their fellows; and heard no other language than the barbarous tongue of their forefathers. Yet, during all this time, immense continents lay under the same sun that blessed them, with countless millions ripening into manhood in its rays. Egypt, Chaldæa, Persia, Syria, Greece, and Rome were moving on the stage, playing their parts before an admiring world, and retiring to give place to younger but no less worthy actors; but of all this the circumscribed Marianne-Islanders had known nothing, and believed nothing. Had some single

individual sailed off, and visited the outside world, and returned and told the story, he would doubtless have been laughed at, and credited by his sceptical brethren with great powers of imagination.

The investigator of mere physical science is frequently nothing more than a Marianne-Islander. Physiology this one knows. It is the island on which he lives. He has climbed its peaks, explored its caverns, sounded its bays, traced its rivers to their source in the mountains, and is familiar with all its tenants. He has paid occasional visits to the neighboring islands, and is satisfied of their existence and immense importance.

Another knows geology. That is the island on which he resides. He knows its history, and believes he can foretell its destiny: its rocks are his intimate friends; and he is well acquainted with their mineral and fossil contents. He passes over to the islands of zoölogy, botany, and chemistry, that lie contiguous, and familiarizes himself with their general appearance. He studies his island home daily with indefatigable industry, turns over every pebble, makes new discoveries that fill his soul with pleasure; but of any outlying realm he knows nothing, believes nothing, cares nothing: he is a Marianne-Islander.

Occasionally the dwellers in these islands meet on a central island to compare their discoveries, and present the result of their labors and studies on their respective islands. But when persons who are, to some extent, conversant with the great outlying realm, have attended their meetings, or presented to them accounts of the islands and continents that they have

visited, they have been very rudely treated, scoffed at, called superstitious, impostors, or imaginative persons. Their statements have been called too extravagant for belief, too wild even for notice; and they have been told by these Marianne-Island know-it-alls, that what could not be seen from the highest peak of the Physical-Science Islands could not be of the slightest importance to the dwellers thereon.

Notwithstanding the disbelief of materialists and material scientists, there lie realms beyond the domain of physical science almost infinitely larger than that portion of our planet unknown to the Marianne-Islanders, abounding with objects of intensest interest, and whose existence can be demonstrated as positively as that of the trilobite in the palæozoic time; though, for ages, the world's keenest observers never dreamed that it had a being.

There is more of man than the scalpel ever dissected, or the eye of even the microscope has beheld; and infinitely more of the exterior universe than any physical sense has yet discovered. Here is an apple, that appeals to every sense. The fingers feel it; the eye sees it; the tongue tastes it; the nose smells it; when it is dropped, the ears hear it: all the senses declare there is an apple. But here is a piece of glass. The ears can hear it; the fingers can feel it; the eye can see it: but the organs of taste and smell know nothing about it; and, if we had only those two organs, we should not know of its existence. The air we breathe can be felt and heard, but neither seen, tasted, nor smelled; and, though two of our senses tell us that the air exists, three of them deny that they have any

knowledge of its being. The eyes alone make us acquainted with the moon and stars; and had all the people of the world been blind, except one man, how could they have credited the marvellous stories that he would have told? There are countless myriads of stars that we never saw, from which no beam ever reached our unassisted eyes, no voice our ears; and had it not been for powerful telescopes, used only by a few, we should have had no knowledge of their existence.

May there not be forms of matter so refined that they elude every sense, as there are vibrations of the air that are inaudible to the ear, and undulations produced by light that the eye has never observed?

Electricity — that wondrous agent that traverses the earth, and transmits into her veins their valuable metallic contents; that passes from the earth with the invisible vapors that ascend and form the clouds, and then returns, revealing its presence in the lightning's flash and the thunder's roll; that speeds over our wires through the salt sea's ooze on the ocean's bed, and over the mountain-summit; one of those genii, more wonderful than Arab dreamer ever conjured up in his wildest imaginings — eluded the knowledge of mankind for thousands of centuries; and multitudes of men and women in our land to-day know nothing of its existence.

"Talk about the spirit of a man," says a sceptic: "where is it? Seated by the dying man, did ever mortal see it take its flight, or hear the fall of its departing feet? Does the body weigh a grain less now that it has departed? Let us see, hear, or feel, this spirit,

and then we shall have some positive proof of its existence. Science can never deal with what the senses do not recognize."

Science is, however, compelled, directly or indirectly, to acknowledge the existence of a spirit, not only in man, but in all organic bodies. What is it in the oak that determines what it shall draw from the soil by its million mouths? What determines the shape that its leaf and blossom shall assume, and what shall be its fruit? Nothing that the senses can perceive. Is it not a spirit possessed by the acorn, that permeates it, watches over it, determines the law of its growth, and the character of the tree that it produces?

J. W. Draper says in his Physiology, "There is no perceptible difference between the primordial cell which is to produce the lowest plant and that which is to evolve itself into the most elaborate mammal." It is nothing, then, that the senses can perceive, that determines whether that primordial cell shall be a fern growing in the shadowy wood, a fish swimming in the brook, or a man studying both; yet that which is invisible in the cell is by far the most important thing about it. Von Baer, the eminent German biologist says, "In my possession are two little embryos in spirit, whose names I have omitted to attach; and at present I am quite unable to say to what class they belong. They may be lizards, or small birds, or very young mammals." What is it, then, that determines whether an embryo shall develop into a snake, and crawl; a bird, and fly; or a quadruped, and run? Nothing that we can recognize by any physical sense. What shall we call it? All organic bodies

possess this, by whatever name we designate it, which determines the form of the body, the peculiarities of its structure, and the loss of which constitutes the death of the individual. Originating from the parents, it causes the offspring to resemble them, carrying with it their blended peculiarities.

Here is an egg that would produce a chicken; for the spirit is within it that would carry it on to its destiny as soon as conditions are favorable. Pass a charge of electricity through it, and no chicken can be hatched from it. Who saw the departing spirit? who heard its retreating footfall? The egg weighs no less; and yet the skilful designer, the elaborate builder, the indefatigable worker, the spirit, is gone.

This spirit, thus possessed by all organic beings, is, of course, possessed by man. It permeates his body, which has been moulded within it, and bears its likeness. It has eyes of its own, whose faculties are much superior to those of the body. It has ears, olfactory and gustatory senses. And these senses of the spirit are much more sensitive than those of the body; and, under favorable conditions, they can be exercised while the body still enshrines the spirit.

Somnambulists are persons in whom some or all of these spiritual senses are at times exercised, and whose manifestations are so startling, that those who have never seen them most commonly deny their existence. One writer says, "The somnambulist has means of perception unknown to man in his normal state, and so singular, that the assertion of their possession, measured by the general experience of the race, appears to be an impudent falsehood or imposture.

"The somnambulist can see with his eyes closed and bandaged: he can then even see what waking men in his place cannot see with their open eyes. He can read the contents of letters, unopened. He can see through clothing, wood and metal boxes, and walls of brick or stone. He can tell what is going on in the room above him, or in the room below. . . . His whole physical frame is transparent to him. He looks through and sees all the functions of life, as though they were going on in a glass case." *

In many persons this condition can be produced artificially; when it is called mesmerism, animal magnetism, &c. All persons familiar with this are aware that phenomena are manifested by mesmeric subjects similar to those of somnambulism, and that entirely transcend the action of the ordinary senses.

A commission appointed by the Royal Academy of Medicine of Paris carefully examined various mesmeric subjects during a period of five years, and then reported to the academy. In their report they state, "We have seen two somnambulists" (and by somnambulists they mean mesmeric subjects) "distinguish — their eyes being closed — objects placed before them. They have told, without touching them, the number and the color of cards; they have read words traced out in the hand, or some lines of a book opened at a chance page: and this phenomenon has occurred when the eyelids were *exactly* closed by the fingers." †

A physician of Paris, Dr. Georget, author of a treatise on "The Physiology of the Nervous System," made

* New American Encyclopædia, art. "Somnambulism."

† Human Magnetism, Newnham, p. 160.

his will in 1826, in which, in an appended clause, he refers to the fact, that, in his work on the nervous system, he had openly professed materialism, but had scarcely published it, he says, "before additional reflections on a very extraordinary phenomenon, somnambulism" (and by it he means mesmeric somnambulism), "no longer allowed me to doubt of the existence, in us and out of us, of an intelligent principle differing entirely from any material existence."

Dr. Mayo says, "A very lucid clairvoyant, her eyes being bandaged, recognizes not the less, without preparation or effort, every acquaintance present in the room; describes their dress, the contents of their purses, or of letters in their pockets; and reads their innermost thoughts." *

It is very easy to see that such things can only be done by the exercise of faculties entirely distinct from those of the ordinary senses: hence those who deny the existence of man's spirit are generally logical enough to deny such phenomena; though a very little candid investigation would satisfy the most sceptical.

Dr. Gregory says, "The direct and immediate perception of absent or distant objects, without the use of the eyes, has been noticed by the earliest authors on animal magnetism in modern times;" † and he gives us many striking examples of it that had come under his own observation.

In fact, nearly every person who has investigated mesmeric phenomena has become a believer in clairvoyance; and the deniers are those who stand aloof

* Popular Superstitions, p. 185. † Letters on Animal Magnetism.

from investigation, declaring that it cannot be done, because, with their limited knowledge of nature, they cannot conceive how such things can be accomplished.

Corresponding with the unseen spirit, by which, as I believe, these wonderful manifestations take place, there are unseen realms in nature. Reichenbach, the well-known German chemist, has enlarged our ideas in reference to the universe, and revealed to us a remarkable realm, which had been entirely unseen and unknown previous to his investigations. He has demonstrated the existence of a peculiar influence in nature, which he calls "od." It cannot be recognized by any of the senses of ordinary individuals, and only by some persons at any time. The persons who can recognize it he calls "sensitives." These he found at first among the sick, but subsequently among those who were quite healthy.

In his "Dynamics of Magnetism" he gives us the details of numerous experiments which prove its existence; and he clears up, by means of it, a variety of phenomena hitherto inexplicable.

His first experiments were made with Miss Nowotny, a young woman twenty-five years of age, who was subject to cataleptic attacks. In the middle of the night, a ninefold horseshoe magnet, capable of supporting ninety pounds, was held before her in absolute darkness, with the armature taken off; and she said she saw two luminous appearances, one at each pole of the magnet. Another lady observed a luminous appearance resting on the poles of the magnet, about a hand's-breadth in height.

Subsequently the baron found scores of *healthy*

sensitives who could see the luminous appearances — some of them as flames nearly four feet high — stream ing from the poles of the magnet. Among the persons who observed these appearances were boys, girls, women, and men, physicians, barristers, artists, professors, and clergymen. There evidently resides in the magnet an unseen influence that attracts iron and steel; but there is also an unseen flame constantly rising from it, — unseen to unsensitive persons, but seen by sensitives, and seen most readily in the greatest darkness.

That the spiritual faculties are exercised in such seeing as this is indicated by the fact, that one of the baron's sensitives was blind: and, when experimenting with him in the dark cellar under his castle, the blind man could see various luminous magnets there, and guided Reichenbach from one to another; the blind, in this case, becoming an excellent guide to one who could see, because he was using superior faculties.

By subsequent experiments, it was discovered that crystals also emit luminous emanations that are distinctly visible to acute sensitives. The baron sums up the result of his experiments with crystals thus: "Crystals in general, like the magnet, emit a fine, flaming light from their poles, usually invisible to healthy eyes, but seen by those of excited, nervous patients, in whom all the senses exist in an unusually acute condition." He says, "I went one very dark night in May, 1844, with a large quartz crystal, to a highly-sensitive maiden, — Miss Angelica Sturman. Her physician, the well-known pathologist, Prof.

Lippich, was accidentally present. We removed all the lights from two rooms, in one of which I put the crystal, in a place unknown to any one save myself. After some delay, to allow our eyes to become accustomed to the darkness, we led the maiden into the room where the crystal was. In a very short time she pointed out to me the spot where I laid the crystal. She said that its whole body was pervaded with a mild light, and that from its point a bluish flame, as large as a man's hand, was blazing with a constantly-waving flicker, sometimes sparkling, losing itself in a fine vapor."

Living plants, he also found, give out light, that is visible to the sensitive, from buds, leaves, stalks, and blossoms. "I once placed," says he, "a flower-pot before the late Prof. Endlicher, who was a good demi-sensitive, in the dark. He cried out with terrified astonishment, 'It is a blue flower, — a gloxinia!' And so it was in truth, — a *Gloxinia speciosa*, of the variety *cærulea*, which he had seen and distinguished by form and color in the completest darkness."

It is not surprising to learn that *human* beings are in like manner luminous. The baron tells us that sensitives see a human being in absolute darkness, at first like a rudely-formed snow-man, and at last like a fiery giant.

Dr Ashburner says that he knows at least fifty persons who have seen a gray, silvery, or a blue light emanating from his hands and fingers; and many persons have declared that they have seen a blue light issuing from his eyes in copious streams, when he had concentrated his thoughts in acts of will or in study.

The emanations proceeding from magnets, crystals, and human bodies, are not only seen by sensitives, but felt by them. Reichenbach found, that, when a friend held a large magnet against a stone wall, Miss Nowotny felt it distinctly in her bed, which was placed near the wall on the opposite side; and she could tell every time the armature was taken off or replaced.

Crystals were found to give off from the point a fine, cool breath, and from the other end a warm breath. This has been proved by many persons, and can be very easily tested.

The influence proceeding from persons can in like manner be felt. Reichenbach tells us that he has had high sensitives who felt the influence of his passes at a distance of one hundred and fifty feet, and even in another room. Dr. Gregory mentions cases in which a lady was magnetized by an operator at a distance of six hundred yards. Mr. H. S. Thompson, in a letter to Dr. Elliotson, quoted by Mayo,* relates the case of a lady whom he magnetized, without any previous knowledge on her part, at a distance of thirty miles.

Unseen to most, yet seen and felt by some, influences proceed from all human beings. These influences impress sensitive persons, and at times convey to them ideas respecting the individuals from whom they proceed, and affect them agreeably and healthfully, or otherwise. Some persons are like walking cesspools, poisoning everywhere the spiritual atmosphere; while others, like roses, diffuse a delicious fragrance around them, and render all with which they are associated blessed by their presence.

* Popular Superstitions and Mesmerism, p. 196.

These influences are even communicated to objects that persons handle, and seem to be indestructible, and from those objects can be communicated to sensitive persons, so that they can accurately describe the persons from whom they emanated.

Dr. J. R. Buchanan, to whose researches we owe this grand discovery, relates in his "Journal of Man" * the first experiment that he ever tried with letters to ascertain whether they could give to a sensitive person the characters of the individual writers. He tells us, that, by many experiments, he had clearly ascertained in a certain young gentleman extraordinary acuteness of sensibility, and resolved to further test his powers. "I proceeded to my trunk, and took forth four letters written by individuals of strongly-marked and peculiar characters. I placed them in his hands, and requested him to watch the mental impressions to which they gave rise in his mind, and report his conceptions of the characters of the writers. He did so; and his descriptions surpassed my anticipations. He entered into the spirit of each character as familiarly as if he had been in contact with the individual, and described not only his intellect and his principles of action, but even his personal appearance and physical constitution. He knew not of whom he was speaking; he did not even know what letters I had placed in his hands: yet I can say, without exaggeration, that his description would not have been more correct if he had described the individuals from familiar personal knowledge. . . .

"So thoroughly did he sympathize with their views

* Vol. i., No. 2, art. "Psychometry."

and feelings, he not only appreciated their position in relation to society, but even discovered their sentiments in reference to each other, and discovered, that, between two of the individuals especially, there was an irreconcilable antagonism. So keenly did he feel their mutual hostility, that, after a time, he requested the suspension of the experiment, as it was disagreeable to him to enter into their contentions, and realize their unpleasant feelings."

The doctor discovered that a letter could give not only the present mental and physical condition of the writer, but that even the past could be called up by its agency, and presented in vision to the sensitive psychometer. He says, "Frequently the writer will appear before the mind's eye of the psychometric explorer with a characteristic expression of countenance, and attitude illustrating some trait of his nature, or engaged in some characteristic act; and, after a time, he will appear in some other scene, equally characteristic, which has been actually a scene in his life. . . .

"In trying several autographs upon the head of the Rev. Mr. G., I was struck with several of his picturesque sketches. For example, in portraying the Rev. Mr. Bascom, the eloquent Methodist divine, who rose by his own energies from a humble position, he said that the first scene that rose to his mind was a humble forest residence, a small clearing in the woods, the kettles hanging over the fire from forked sticks; a youth of studious disposition cultivating his mind. Then various transitions occurred: the country advanced in civilization; villages and cities sprang up;

the youth was observed in other scenes, and soon became a powerful, eloquent, and universally-admired orator of the pulpit." *

So profoundly did Dr. Buchanan become impressed with the results of his numerous experiments, that he says, "If, then, man, in every act, leaves the impression or daguerrotype of his mental being upon the scenes of his life, and subjects of his action, we are by this law furnished with a new clew to the history of our race; and I think it highly probable, that, by the application of this principle, the chasms of history may be supplied, and a glimpse may be obtained of unrecorded ages and nations whose early history is lost in darkness. The ancient manuscripts, paintings, and other works of art, which still exist, the crucifixes, garments, armor, and other ancient relics, still preserved, are doubtless still instinct with the spirit that produced them, and capable of revealing to psychometric exploration the living realities with which they were once connected. At present, these relics are barren of significance. Their hidden meaning lies waiting the future explorer, as the hieroglyphics of Egypt awaited the arrival of Champollion to interpret their significance. . . .

"*The past is entombed in the present.* The world is its own enduring monument; and that which is true of its physical is likewise true of its mental career." Then, with deep prophetic insight, he adds, "The discoveries of psychometry will enable us to explore the history of man, as those of geology enable us to explore

* Journal of Man, vol. i., No. 4, art. "Psychometry."

the history of the earth; and I believe that hereafter the psychologist and the geologist will go hand in hand, — the one portraying the earth, its animals and its vegetation; while the other portrays the human beings who have roamed over its surface in the shadows and darkness of primeval barbarism. Ay, the mental telescope is now discovered which may pierce the depths of the past, and bring us in full view of all the grand and tragic passages of ancient history." This was published in April, 1849.

I was not aware, when the first volume of "The Soul of Things" was written, that many of the discoveries related in that volume had thus been so fully anticipated by Dr. Buchanan, or I should have been glad to recognize it. The more advanced a thought is, the slower its general acceptance. Its time must, however, come; and, when psychometry is accepted, justice will be done to one of the most vigorous thinkers, boldest writers, and greatest discoverers, of this or of any age.

I find, also, that many of our discoveries had been anticipated by mesmeric operators; and one of the boldest of them, Dr. William Gregory, publishes in his "Letters on Animal Magnetism" some interesting facts in illustration of them. He speaks of a remarkable clairvoyant, whom he designates as E., and tells us that from a letter written by the person, or from a lock of hair, she "will often trace the history of the person for a considerable period down to the present moment." *

He says, "Clairvoyants can not only see dead per-

* Gregory's Letters on Animal Magnetism, p. 128 (1851).

sons, but those of former ages, and the events in which they are concerned. . . . One clairvoyant, for instance, traced the history of a ring for about three hundred years, and was found to be accurate for seventy or eighty years back, or more." And he then adds the statement: "This power of seeing the past is truly remarkable, and deeply interesting. It would appear to indicate that what has once existed or happened leaves a trace of some kind, perceptible to the inner vision and soul of man when no longer obscured or overpowered by the coarser impressions conveyed to the sensorium by the external senses."

The truth is, in my opinion, vastly more wonderful than either Dr. Buchanan or Dr. Gregory dared to say, extravagant as their statements doubtless seemed to most who read them. The past is not "entombed in the present:" it does not merely "leave a trace." The past lives in the present, and can be read as accurately as if the observer had been present at the time of its original existence: indeed, in some respects, more easily and more thoroughly than he could have done then; for he is able to observe it with more perfect faculties. Dr. Gregory himself says, "In point of fact, in magnetic experiments with hair and with writing, past events are described every day as vividly as present ones, . . . and this, too, where the action of sympathy with the operator or inquirer is excluded." * He had not learned, however, what Dr. Buchanan demonstrated, that mesmerism is altogether unnecessary for the development of this power, which can

* Letters on Animal Magnetism, p. 235.

be exercised quite as readily, and much more accurately, when the person is examining, to all appearance, in a perfectly normal state.

Some time in the year 1851, while testing with my sister, Anne Denton Cridge, the power to read character from letters, as described by Dr. Buchanan, without knowing of any similar discoveries such as related, I found that visions of various kinds were seen by her when objects were placed upon her forehead, and her eyes closed; and that the visions had generally a direct connection with the history of the objects. When the objects were mineral or fossil specimens, I found that the visions were sometimes connected with their ancient geological history, and sometimes with their modern surroundings; and eventually I found, that, in this way, it would be possible to work out, in time, the entire history of our planet in its minutest details. In the first volume of "The Soul of Things," Mrs. Denton and I have recorded the results of experiments carefully conducted for a series of years; and now, after experimenting for twenty-two years, I am more fully convinced of the immense importance of this method of exploration and study, and am well satisfied, that, by means of it, all forms of life that have ever dwelt upon our globe can be rescued from the oblivion to which time had apparently consigned so many of them. We can not only learn the form of every animal, but its habits, and with microscopic gaze watch it more closely and accurately than naturalists can the living animals around them. The history of man, during the thousands of centuries in which he has been emerging from

the brutal condition of our primitive ancestors, can be read most accurately in its minutest details, as some of the chapters in this volume clearly indicate; and even the chronological order of the events that have transpired upon our planet can be known, and the line of man's development be accurately drawn.

Nor is this vision confined to objects belonging to our own planet. The luminous vibrations proceeding from the various heavenly bodies, when shining on the forehead of the sensitive, are also able to call up visions relating apparently to the bodies from which they emanate; and I see good reason to believe that in this way we can read the story of every planet of the solar system, and of even the more distant bodies of the universe.

I had not experimented very long before I discovered that visions were not only presented to the internal eye, but sounds to the internal ear. The eye saw the lightning's flash, and the ear heard the thunder's roll. The eye beheld the water leap into the chasm, and the ear recognized the cataract's roar. The eagle's scream, the volcano's bellow, the cricket's chirp, and the low wind's sigh, all were as readily heard as if the sensitive had been present at the time, and the bodily senses thus influenced. And what was true of seeing and hearing was true of the exercise of every sense. The olfactory nerves perceived the odor of the flower as readily as the eye perceived its beauty, and the cheek felt the hot breath of the volcano as easily as the ear heard its sullen roar; while the tongue tasted the sweet fruit or the luscious juice,

and enjoyed their flavor almost as much as if the psychometer had been present in proper person.

But how can objects that have had no sensible existence upon our planet for millions of years be seen, heard, and tasted? How can the volcano be heard whose last eruption took place before Europe was separated from Africa? How can grapes be tasted that grew when Vermont had the climate of Texas? and how can the glacier be seen which covered New England to the depth of a mile? That these things can be done, are done, I am satisfied: how they are done, it seems almost impossible to conjecture. There appears to be a spiritual universe, an infinite realm, into which we are just entering, and of which the wildest dreamer never seems to have conceived: while there is in some, and probably is to be developed in all, the power to enter this realm, and explore it; and in time the hidden things of darkness are to be made clear, as if bathed in the rays of a noonday sun.

At first, the sensitive, or psychometer, is generally a merely passive spectator, like one who sits and observes a panorama; but in time he becomes able to influence the visions, — to pass them along rapidly, or retain them longer for a close examination. Then the psychometer, at times, dwells in that past whose history seems to be contained in the specimen. Like "a free spirit unhindered by gravitating body," he moves over its savannas; dives beneath its waters; soars to the summits of its loftiest mountains; visits its caves, and watches their tenants; or plunges into the fiery craters, and sees the rushing floods as they are belched from the earth's hot hell.

At length the psychometer becomes released even from the specimen. At will he leaves the room, passes out into the air, looks down upon the city, sees the earth beneath him like a map, or, sailing still higher, beholds the round world rolling into darkness or sunlight beneath him. He drops upon island or continent, watches the wild tribes of Africa, explores the desert interior of Australia, or solves the problem of the earth's mysterious poles. He can do more than this: he becomes master of the ages. At his command the past of island and continent come up like ghosts from the infinite night; and he sees what they were and how they were, what forms tenanted them, and marks their first human visitants; seeing the growth of a continent, and its fruitage in humanity, within the boundary of a little hour.

Nor is this all: more rapidly than light, out goes the spirit into space, visits the moon, floats on the fiery billows of the sun, rides with the flying comet, and makes the acquaintance of the advanced denizens of our sister planets; and it would seem that the universe scarcely holds a secret that it cannot behold with open eye.

This wonderful power is not confined to a few; though there are but few that can exercise it in its highest manifestations, without considerable culture. Those persons who can see objects with the eyes closed are generally persons who have a large natural endowment of this faculty. The objects are sometimes landscapes, and sometimes faces of various persons (sometimes known, but generally unknown), that are most frequently observed when the seer is perfectly passive,

and hence most readily just before sleep. Let such persons take specimens of any kind, and place upon the forehead, closing the eyes, and then observe the images that present themselves to the internal vision: they will be able, in many cases, to observe the connection between the images and the specimens. Sometimes the images may appear to be entirely foreign, when a more accurate knowledge of the history of the specimen might show them to be remarkably appropriate; while, in other cases, they may be foreign to all that the most extended knowledge would indicate; as a mere speck of dust on the surface of a specimen may call up images entirely distinct from those that belong to it; and this, I think, is most likely to occur when the history of the specimen itself is not particularly impressive.

While all psychometers that I have known have been subject to spontaneous visions such as I have described, the persons who are not known as psychometers that have such visions are very numerous, — certainly as many as one in ten of our adult female population, and perhaps one in twenty of the male.

I have questioned many persons in reference to these spontaneous visions: and I give a few cases; for all such phenomena are worthy of examination. They will, I think, as we become better acquainted with them, shed light upon realms into whose exploration we are just entering.

Mrs. W., Bridgeport, Conn. — Has always seen objects with the eyes closed; generally faces, sometimes pleasant, and sometimes disagreeable: the face alone was visible. They seem to move like a panorama, one

following another. None that she was able to recognize. Some were distorted. She once saw a large archway, and through it a beautiful landscape.

Miss W., Littleton, Mass. — Sees pleasant landscapes just before going to sleep; less frequently, faces. Always scenes never before observed, and always soft and beautiful: they move like a panorama. She does not know that the will has any power over them.

Mr. F., Waltham, Mass. — Sees faces when his eyes are closed; generally after he goes to bed, and before sleep. (His sister did the same.) Does not often see more than the face. Once, when very young, saw the whole person, — a woman. They die out gradually, and are succeeded by others. Does not remember that he ever saw any one he knew. They are mostly faces of white persons, but often distorted; sometimes negro faces. His will has power over them: at times, he can will an unpleasant face away. They sometimes have long noses and long chins. Thinks, when his stomach is disordered, they are more liable to be distorted.

Miss G. (age seventy-six), Hyde Park, Mass. — "I see grotesque faces; one comes with a large nose, and another with a large mouth; and they melt into one another like dissolving-views. They are not like any persons' faces that I remember. I only see the head and face. Generally see them early in the morning. Do not think I ever saw any with beard or whiskers. They do not look wicked, but odd. They seem to look very intently. Now and then, but very rarely, I see a black face; but they are generally white: they have good foreheads. Very rarely I see landscapes, — scenes associated with my childhood. I have

always had these visions; and they are as vivid now as ever."

Mrs. C., Malden. — Has frequently seen faces. They come and go like a panorama or dissolving-view, mostly at night, after lying down. Does not recollect that she ever saw any one she knew. Sometimes sees the whole figure. Sees both sexes; sometimes clear, and sometimes indistinct.

Miss A., Wellesley. — Sees faces at night, just after lying down, when she cannot get to sleep. They are human faces, and generally unpleasant; and sometimes they appear to be laughing, or making faces. Never sees them when perfectly well, and most frequently, she thinks, when her head is affected. Nothing but faces are seen: one succeeds another, somewhat slowly. Thinks they were always, or almost always, male faces; and does not think that any of them had beard or whiskers. Some are pleasant, and some very unpleasant. They last from one to five minutes: one fades out, and another comes in. Thinks she inherits this power from her mother, who sees when well, as well as when sick. All her family have the same power. Saw when she was a child, and, she thinks, more clearly.

Such facts are certainly as worthy to be recorded as the spots of a beetle's wing-case are to be drawn: the philosophy to explain them will be forthcoming, I have no doubt.

CHAPTER II.

GEOGRAPHICAL EXAMINATIONS.

In examinations such as are recorded in this volume, the specimen is generally placed on the centre of the forehead, about an inch above the line of the eyebrows, and held there by the psychometer during the examination. His eyes are closed: but otherwise he appears to be in a perfectly normal condition during the time, and can readily notice what takes place in the room; frequently laying down the specimen, joining in the conversation, or drawing objects seen, and then going on with the examination. When the specimen is in powder, it is merely necessary to stroke the forehead with as much as will cling to a damp finger; and, where heavenly bodies are examined, the rays are allowed to shine upon the forehead. The identical language of the psychometer is generally retained. I have occasionally suggested to Sherman appropriate words and phrases when he found a difficulty in expressing his meaning; but no thought presented by him has been knowingly changed, nor has any idea been added; and, with very few exceptions, the whole of the examination is given.

AN ANCIENT CALIFORNIAN VOLCANO IN ACTION.

In February, 1867, being in Chicago, I received from Mr. Coles of that place a fragment of an elephant's tusk, taken, as he informed me, from under twenty feet of lava, by miners digging for gold at Columbia, near Stanislaus River, Tuolumne County, California. Several teeth and tusks were found in the vicinity. He also informed me that Mrs. Mitchell, a clairvoyant, now of New York, had examined it psychometrically, having no knowledge of its history. She told him that she felt intense thirst, and as if she could drink gallons or barrels of water. Her foot appeared to be as large as a peck-measure. She was enclosed in some way, and could not get out; and was about to be overwhelmed. It seemed as if thick mud was coming down a ravine where she was, and that she was about to be buried by it.

Shortly afterward, on arriving at Wellesley, I gave the specimen, which was about the size of a small bean, to my son Sherman, then a boy of ten years of age, but with whom I had previously experimented for years; who, after placing it on his forehead, and closing his eyes, said at once, —

"I see a very large elephant dead. It is a very foggy day. He is near a large stream; and there is very high grass, with broad leaves, growing up. I see two others coming along, wading in the grass.

"The clouds burst away at once; and now there is a sunny day. I see as many as twenty coming out of a kind of path in the woods. They make the ground shake as they run. As they move along, they

twine their trunks round small trees, and pull them up by the roots. I patted one, and he seemed to like it (1). I could not reach to the top of his leg. It is hot here, but a very pleasant day. I hear animals howling through the woods." (I said, "Keep to the elephants.") "One of them has jerked up a good-sized tree. They are now at the water, drinking: they suck it up with their trunks. They have monstrous teeth. One of them is hollow: I see a hole in it. A great alligator comes out of the water. He runs at an elephant with open mouth. The elephant hits him on the head with his trunk: he crawls off.

"There are no trees near the river; but back of me there is a forest, where the elephants came out. I see soggy places with muck in them. They are returning into the woods.

"I see Indians (2) sticking spears into them. They have killed one, and nearly another. They are bleeding badly. They have killed a number now; but the elephants are running. Why! there was a tremendous noise just then underground! The trees bend over; the elephants run; the ground is cracking. I see it heave nearly like the ocean. A good many trees have fallen, — the rotten ones. Now another shock, — a hard one. One elephant fell down. The Indians are running. The ground rose up as if there was something under it: it has made a large hill. Oh! there is a volcano at the top of it: a black cloud rose out of it at first. Stones are flying in the air, — big ones. The lava is running down the sides: they are very steep. It sends up red-hot stones and lava very high. One side of the mountain has broken away; and a river of

lava is running out. There is such a noise, I cannot hear myself speak. A stone fell near me, as big as the sewing-machine; yet the volcano must be three miles off. How curious it was to see that hill rise! it went up so fast! Trees went up with it; and they are on fire.

"The lava ran down to that river; and the water went like a flash, with a hissing noise. It is running down the bed of the river now. It looks brighter than the sun. It is white, it is so hot. It runs fast down the hill, — very fast. It is a grand sight. It lights the sky. It is red. A cloud hides the sun. It is done sending up stones now. The lava is running down the river as far as I can see, and small streams over the country; and the woods are on fire. It is far above the banks of the river, — a river of fire. The woods back of me are on fire now: I hear them snap and crack. I can't tell where the elephants are gone; and I do not care.

"I see one now. He is lashing the ground with his trunk, and running into the road. I see the pack running now. The blaze of the woods is nearly touching them: they are running through the smoke. One dropped on the ground, he is so tired: he jumped up again. They have got on to a hill. A great many are dead," — killed, as he said, by the gas that rose out of the ground.

("Go to the volcano.") "Oh! it is terribly hot. One part of the crater is not full; but on the other side it is coming out with great fury. I see metal running down through little holes in the lava back again. I see green, blue, and yellow, not like the rest.

The blue looks pretty: some of that runs down. I see other metals that are between yellow and red, and some real yellow. The lava does not blaze much; but it sets every thing in a blaze. Sometimes the lava goes up twice as high as the mountain; and then it slacks up, and just pours over the top.

"I am at the foot of the mountain now. It sounds like thunder underground, every minute or so. The sky is clear on one side; but more than half is covered with a dense cloud. The lava coming out now is more liquid than the other that has been out some time: it runs faster. The big black cloud spreads fast. It is black as tar near the volcano, and you can see nothing but the bright lava. The crater was full at first; but it burst out at one side.

"There is a torrent of very thick mud (3) on one side, running down the mountain: it came from the other side. It goes much slower than the lava. The mountain keeps rising. It is twice as large as it was when I first saw it. The mud moves slowly. It is pushed along by what follows it. It goes about as fast as I can walk. It is pouring into a lake. It must be hot: it makes the water steam. It seems as if I went twenty miles off; and I can see the volcano, like a great bubble, pouring out lava.

"I feel the influence of gold around here: it seems as if there was a good deal of it."

It is proper to state that the boy had no knowledge of the specimen whatever; and certainly had not the most distant idea of what it was, or where it was obtained.

The frontispiece is reduced from a drawing by him

from a sketch which he made at the time, and afterward more carefully drew. The following description from Mantell's "Wonders of Geology" shows that at least one similar uprising of the ground has taken place within the historic period: —

"In Mexico there is an extensive plain called the Malpays, which, in 1759, was covered by fields of cotton, sugar-cane, and indigo, irrigated by streams, and bounded by basaltic mountains; the nearest active volcano being at the distance of eighty miles. In the night of Sept. 28, a subterranean noise was heard; and part of the plain of the Malpays, from three to four miles in extent, rose up like a mass of viscid fluid, in the shape of a bladder or dome, to a height of nearly seventeen hundred feet. Flames issued forth; fragments of red-hot stones were thrown to prodigious heights; and through a thick cloud of ashes, illumined by volcanic fire, the softened surface of the earth was seen to swell up like an agitated sea."

(1.) But how could a boy pat an elephant, and the elephant appear to like it, when that elephant has been dead for at least a hundred thousand years? I do not pretend to know. I record what the psychometer states: and I am satisfied that the psychometer states what appears to be; for statements of a similar kind have been made to me by several who had no means of knowing the similar experiences of others. If Nature presents these facts, it is the business of the truth-lover and truth-seeker to record them. Their meaning will some day be discerned.

(2.) That human beings lived in California when this lava-stream was poured out, and huge elephan-

tine quadrupeds browsed on its forest-trees, would have been regarded as a wild and extravagant opinion but a few years ago. Discoveries made very recently have, however, proved its correctness. At a meeting of the American Association for the Advancement of Science, held in Chicago in August, 1868, Prof. Whitney, State geologist of California, exhibited a human skull, said to have been obtained at the depth of a hundred and thirty feet below the surface, and under four beds of consolidated volcanic ash locally known as lava. "The base of the skull is embedded in a mass of bone breccia, and small pebbles of volcanic rock, incrusted with a thin layer of carbonate of lime. It has a remarkable resemblance to the skull of a Digger Indian." "Prof. Whitney insisted most strongly, that, apart from any thing connected with this skull, the labors of the survey had clearly demonstrated the fact, that man and the mastodon and elephant had been contemporaneous in California."

In the Museum of the Boston Natural-history Society is a portion of a human skull, accompanied by the following label: "Fossil human skull. From a shaft in Table Mountain, California, found a hundred and eighty feet below the surface, in gold drift, among rolled stones, and near mastodon *débris* overlying strata of basaltic compactness and hardness. Found July, 1857. From C. F. Winslow, M.D." The attention of the public was called to this by Mr. Scudder in the October number of "The American Naturalist" for 1868, when I first became aware of it. The first psychometric examination was made in February, 1867, at a time when the discovery in Cala-

veras County had not been made, and when I did not know of the finding of a human skull in the river-bed and under the lava-flow described during the psychometric examinations.

(3.) I do not think that Sherman knew, at the time the examination was made, any thing of the torrents of mud that are sometimes poured out of volcanoes; yet he does not observe that some of the elephants were overwhelmed by the mud, as the examination of Mrs. Mitchell indicates.

That the fragment of a fossil elephant's tusk should be able to call up visions of the original animal to which it belonged, and of the catastrophe in which it probably perished ages ago, could never be established from a single experiment like this, remarkable as it is. Three weeks after the above examination, I submitted the same specimen to Mrs. Denton, who knew nothing of its history or of the previous examination, and did not even see the specimen previous to her description.

"There is an extensive river-valley here, reaching the hills, on one side at least. There is a very large swamp on both sides of the river, extending to the hills on both sides, I think. The hills are not so high on one side as the other. There are tall, juicy reeds, and coarse vegetation, in the swamp.

"Large bones come up, — very large indeed. Some of them look like fossil bones.

"I had a glimpse of a very large elephant; there are many of them here: and I sense other animals. There are times when the water in this swamp is high and clear: it is so now. I can see the vegetation under it. It seems to be turning into a lake. I

looked for it to subside; but it deepens and widens till it becomes a large lake.

"There is a volcano some distance from here, that is very active, and seems to affect this place. A large extent of land here is sinking in connection with that volcano. What a fury it is! I can see it from here, though it is at a great distance. As it keeps pouring out its contents, this keeps sinking. The water fills in, and the trees and all else are submerged. I see immense bodies of rock go up from the volcano; but I am too low to see the crater. A very thick, heavy smoke is rising from it: indeed, there are two clouds of smoke, one above another. The rocks go up with great force. The ground shakes and heaves and trembles. The whole country is heaving and sinking; and the animals are all in commotion in consequence." ("Visit the volcano.")

"I went underground to it: I could not travel over the surface. It *is* pouring out lava in immense quantities. It lights up the whole sky and country for an immense distance. How it draws! It seems to suck the lava up from a distance all around. The explosions are terrific, and very numerous. The side of the crater is broken away; and the lava pours out there, instead of rising to the top. Every thing comes very slowly; but it is continuous.

"I am back to the elephants again. I get the tusks and trunk of one every little while. They are an enormous weight; and it makes my head feel as if I could not move it. The elephants seem to be farther back than the formation of the lake. I think many of them and other animals perished in it.

"Two or three times I have seen an animal resembling a human being: if human, it is very low. It walks on two feet: they are very long. It is covered with long hair, which is shorter toward the wrist. I wish I could draw the outline of the face! It is horrible: it has a snaky look. I see some paddling in water; but they are somewhat different. They have less hair on the body; but the hair on the head is long, tangled, and stiff" (1). (I then told her what the specimen was.)

"I got the impression that it was part of a tusk, from tusks coming up so often, and remaining so long. That stream is very old, and once occupied a much wider space in the valley.

"I'm among the mountain-tops now. One is gaping wide, black, and cold, — a dead volcano. I can look down a long way, and see nothing but a black, gaping hole.

"It had not been quiet long. Previous to that eruption, the country round had been agitated for a long time. Before that, how beautiful it was! It had a delightful climate; though we should probably consider it too warm. So quiet and peaceful for an immense period before this change! I go back a long, long time. It is a country rich in vegetable productions, birds, and beasts: all at home, all tranquil. A perfectly delightful country. Its height tempers the climate. The birds are very musical, and the animals bright and active. I observe the sea at a distance, and feel the sea-breeze occasionally."

By inquiry, I found that her first position was in the valley, below the volcano; and that the dead volcano lay a little west of north.

(1.) No human remains have yet been found on this continent resembling the individuals described by Mrs. Denton; those discovered belonging to that period being little inferior to the present Digger Indian: but it is quite possible that inferior races existed contemporary with them, that have subsequently perished. Doubtless many more races of men have perished than live on our planet to-day.

Fifteen months after this, my sister, Anne Denton Cridge, examined the same specimen, knowing nothing whatever of its previous history, or the examinations that had been made.

"In the first place I saw what looked like water, and waves of water, with cliffs at the side: but, now that I come near to it, it is not water, but white rock; and it has a curious appearance, as if it had been vomited out of a volcano. It is quite rough on the surface. I walk over the country on this, and come to a hot spring. In one place the water spouts up like a fountain. The rocks are very hot near the surface. The peculiar appearance of the country round was caused, I think, by volcanic agency.

"Now I see water; and the lava has run into it, so that the original rocks are overlaid by it.

"The land I first came to is much higher than the water; so that it has the appearance of a mountainous country all round. The hills are pointed, and have all been formed by upheavals.

"I can go back to a time when the country was flat, like one vast plain. This was broken by a volcano suddenly springing up. It commences to smoke.

How dense the smoke is! It envelops the whole country round. Now I see flames bursting through the smoke, and what look like balls of fire sent up. It looks grand. The ground all round heaves as if it was nothing but thin paper; and quite a hill is raised there. It is vomiting out lava.

"Now I see another one on the other side; that is, east from the first. Many places rise; but one pours out great floods, that change the whole face of the country. The other was insignificant compared with this. Afterward they become quiet; and nothing is to be seen but the general change in the country.

"I seem to come down in time. I see fishing-boats and a city away off. I see spires. How prettily it is situated! It is on a portion of land that forms something of a peninsula (1).

"Previous to the eruption, that part of the country was low, flat, and marshy. No person would have dreamed that it would ever be affected by volcanic action. The rocks look dark and shaly underneath. I see no marks of civilization. It seems a vast wilderness. About a hundred miles from this place there had been a small volcano in the north; but it had not changed the appearance of the country much. It was more like a chimney than any thing else. There were birds that used to catch fish. There are large flocks of them, black and white." ("Any other animal?") "Yes: there are many kinds; some reptiles. I see one with short legs, scaly back, and large, projecting jaws, that catches birds with its mouth as some animals catch flies. I see one struggling in its jaws. It crushes and swallows them, feathers and all.

"There is an animal as large as a large bear, white, — a mammal. It has two tusks, not very large; but they give it a savage appearance. It has a face somewhat like a lioness. It has a long, smooth tail, with a tuft of hair at the end. I see now a small animal that looks like a wild-cat: it has a savage, tigerish appearance." She laid the specimen down, and twenty minutes after, on taking it up again, said instantly, " Its head is disproportionately large.

" There are large serpents; oh, how large! They must be boa-constrictors. I see two or three winding in the deep grass. The ground is very damp. Now I see one climbing a tree, apparently after something. It climbs easily, notwithstanding its size. It is after birds; they seem to be in danger from every thing.

" I see some very small white animals. (What makes so many animals white?) They are no larger than medium-sized rats, but broader; and their ears are somewhat larger. They make holes in the ground where they have nests. They are pretty.

" Now I see a skeleton of some monstrous animal. It looks almost as if the skeleton of a house had fallen. The head part is highest and broadest, and it tapers down; but I don't see it distinctly. It seems as if I stood near the head part, and the other is in the shade. I see the large sockets where the eyes have been: they are as large as a common-sized saucer. It is some distance from the water. It looks like a huge skeleton I once saw in London, with this exception, — that the head is so very large, and the body tapers down, so that the hind-legs are not as long as the fore-legs. When alive, it was dark-colored, — a

brownish black. It has a leathery appearance, and is marked all over with irregular indentations. It had a very long tail. It used to twist it round the branches (2). I cannot see of what use it was. The animal seems most like a mastodon. I see its blood circulating: its heart is immense. It does not look savage: its eye is mild. It seems to have rather a small eye for so large an animal. It feeds upon trees. I see a green branch in its mouth."

Next day the same specimen was again examined by Mrs. Cridge; nothing having yet been told her regarding it.

"It has a long head, which is very broad in the upper portion, but, for such a large animal, has a small mouth. The teeth are broad and flat. It has a trunk; but it does not look very long. It tears down branches of trees. It can attach its tail to a tree; so that it assists in tearing down those in front. It likes tender twigs and buds. It seems remarkably gentle for such a monster. Its feet are divided into five toes: the fifth, which comes on the inner side of the foot, is merely rudimentary.

"I should think that a great deal of whitish rock would be found in this locality, of a volcanic character." ("Are there any human beings?") "I go up a valley, a hundred miles or more; and now I see human beings. They are short in stature; have straight, black hair; and are dark-complexioned. Their arms are bare; and they have something over the chest that hangs down, so that they have great freedom of motion. They are active, and are now playing a game in which they jump over a large stone: even little children spring over it. I do not see them, but know it.

"I see water. They tie bark of trees together with some tough part of a tree, and sail on it for a raft: they could not go far.

"Now I see some cutting stones, — shaping stone implements with stone. The stone they work with is darker in color, and closer in texture. Some are sitting down, and working quite industriously. The mechanical faculties are awakened somewhat. They have more constructiveness than those I saw the other night; though the intellect is less developed than in present white races. Some of the animal propensities are not as active: for instance, amativeness was then periodic. There was a regular time for the birth of young. They wandered round, and never cultivated the soil. They depended on the chase, fishing, &c. The men were not more than five feet high, and the women shorter still. I see some women carrying burdens on their backs; but I do not see them distinctly."

(1.) The city seen by Mrs. Cridge was probably San Francisco. The beauty of its situation has been remarked by multitudes; and, when she states that it is situated upon a "portion of land that forms something of a peninsula," she describes its situation exactly. That portion of land on which the city is situated, bounded by San-Francisco Bay on the one side, and by the Pacific Ocean on the other, is a peninsula. The distance of San Francisco from the locality where the eruption took place is perhaps a hundred and fifty miles; but the vision of the psychometer is at times much more extended than that of the ordinary observer.

(2.) "What a strange story," says some one, "that mastodons had prehensile tails!" Just as strange to me as to any one. No naturalist dreams of any such thing. But there are as strange things in the animal kingdom to-day as that. A subsequent examination which Sherman made, and which will be found recorded in another place, satisfies me that some species of ancient pachyderms were furnished with these remarkable appendages.

It should be stated that these descriptions were given without hints of any kind to the examiners as to the nature of the specimens, or what was expected from them, without any leading questions being asked; and the whole of what was said by the three psychometers is given. Is it not evident, that, in some way, they were able to become spectators of the same phenomena, though each looked at them from a different point of view, and that the phenomena were connected with the history of the specimen? This becomes more evident as the facts concerning the region where the specimen was obtained are better known. Hittel says, in his "Resources of California," "The Table Mountain in Tuolumne County is the most remarkable elevation of its kind in the State. It has an average height of five hundred feet, an average width of four hundred yards, a length of thirty miles, and a surface almost perfectly flat, slightly descending toward the west. It was evidently formed by an immense stream of lava, which was once confined between banks higher than its own surface; which banks have since been washed away, leaving the stream of lava stand-

ing like a mountain above the level of the adjacent country. The sides near the top are perpendicular, and of solid basalt: farther down they are sloping, and composed of dirt, and fragments of basalt that have fallen from above. Under the basalt lie the gravel and sand of the ancient river-bed, enclosed at the sides by ridges of rock which rise above the level of the adjacent plain. . . . It is established beyond all reasonable doubt, that the auriferous deposit under the basalt was once the bed of an ancient river. Every mark indicates it. The wide water-worn bed, the bends, the bars, the deposits of gravel in eddies, the collection of coarse gold in the centre, the position of the large flat stones, — all pointing down stream, — the remains of fresh-water mollusks, and the beds of little tributary streams, — all these are conclusive proof that a large river once ran where this mountain now stands."

Columbia, where the specimen examined was obtained, is situated where the Table-Mountain channel crosses a limestone belt, and where the lava has been much eroded and disintegrated. The Stanislaus River takes the same general course as the lava-stream had done; and it was doubtless the ancient bed of that river that was filled by it. J. Ross Browne, in his recent "Report on the Mineral Resources of the States and Territories West of the Rocky Mountains," says of the lava composing Table Mountain, "It poured out of a volcano near Silver Mountain in Alpine County, and took the same general course as the present Stanislaus River, which has cut across it in various places." Such a stream of lava, then, as Sherman saw, once ran from a volcano down the bed of an ancient river, and flowed

over the very spot from which the specimen examined was taken. Of this I knew nothing at the time the examination was made; so that mind-reading as a possible explanation of its remarkable character is out of the question.

That all the past exists in a spiritual state, and can be seen, heard, and felt, in short, recognized by all the spiritual senses of some sensitive individuals, seems to be demonstrated by our experiments. The volcano that poured out those fiery floods a hundred thousand years ago seems to be in eruption as actively now as ever; so that three independent observers behold it, and describe it in nearly similar terms. The ground is still heaving, the stones flying, the trees falling, and the elephants and men running. And, if so, all the past exists: every river that ever ran runs now; every volcano of the great past is still in full blast; all the earthquakes of a million ages are heaving. The poet says, "Where are the flowers that bloomed a thousand years ago?" and the answer is, They are still blooming fair as ever: they have lost none of their beauty or exquisite perfume. Time has not faded one petal; nor have the winds of ages ruffled one leaf. The bees still buzz around them; and the birds, that sang so long ago, still sing in their boughs. The men of the stone age wander through the woods of America, of France, Germany, and England, and, with clubs and stone spears, attack bears and elephants, and feed upon their carcasses; they still fish in the waters, and float on logs down the numerous streams; they shelter themselves in the caves, and make rude nests in the trees. We are with the most ancient of the

ancients, and they are still with us; and we can study them as easily as we can the men of the present. No fact of the past is lost, no lesson of the past forgotten.

After experimenting for some years, I found that a specimen was not absolutely essential (though I still think that examinations with specimens are most reliable), but that the psychometer, looking at a map, and then closing the eyes, had the sensation of going up, passing through the air, and looking down upon the surface of the earth from his eminence, and could thus see it like a map, and then describe with great accuracy places previously all unknown. Sherman's knowledge of geography, at the time I commenced to experiment with him, was exceedingly limited; and I could readily perceive that he had sources of information totally distinct from those of ordinary sensation. Those who think that guessing would account for what I present would do well to experiment with boys of from nine to fourteen, and compare their descriptions of places of which they had never heard with the actual facts.

ISLAND OF SOCOTRA.

The most common explanation of pyschometric phenomena is mind-reading. That individuals can at times read the thoughts of others, I have no doubt. Mesmerizers have been familiar with the exercise of such a power for more than thirty years. I do not say that the descriptions of psychometers are never influenced by the minds of those with whom they are associated when giving them; but I have frequently been surprised to find that the strongest impression on

my mind, at the time examinations were being made, failed to produce the slightest effect on the psychometer's descriptions. To shut off the possibility of my mind influencing geographical descriptions, Mrs. Denton and I thought it would be well to try an island of which neither of us had the least geographical knowledge, save what its position on the map might indicate. The island chosen was Socotra. The time was in May, 1870.

"It has a rocky coast on this side" (west or north side, not sure which), "if I have got to the right one. I mean high. It is a rocky island. On this side it looks almost like a rock in the sea (1). On the other side it is different, — lower, and not precipitous. It is inhabited. I will see if I can get the habits of the people. They are rather free and easy, I think; that is, the natives. Their habitations are poor; and they have but little disposition to improve them (2). There seems to be a wandering disposition about them. I do not think there are many Europeans there (3). I think they garden some. They try to raise something (4).

"There seem to be two influences. Near the coast there seems to be more of a business kind of life. The people are rather yellowish; and I think there are some negroes among them (5). I think there are monkeys on the island, or some kind of wildish men. They are a queer set, take them all round."

The next night I induced Sherman to try the same island. "It is a very handsome island, very green, where I see it. It is very still here: the water is still. I see some very handsome birds: they have red tails

and greenish backs. I don't like the look of their bills: they are scaly.

"There are no mountains on it; not what I should call mountains. I see spots as large as this room covered with loose sand: they look curious. A good many of the trees stand loose; they have little hold on the soil." (In answer to a question,) "I am near the shore on the west side. I see some people now sailing round in a boat. It is the most curious boat I ever saw. It bulges out at the side almost like a canal-boat. They are very dirty people. They catch fish, and cook them whole, and eat them.

"I've come to a place where they live, I guess. It looks more like a play-house than a real house. It is made of rough boards chipped off with hatchets. The people have a dark, dirty look. I don't like the look of them. I see a girl bare, — all but a cloth round her middle, and a cap made of leaves.

"I see a man driving a lot of pigs through the woods. He has a sharp thing, with an elastic string to it: he shoots it at them, and it jumps back. He is a white man, with a very long beard, — very long. The thing he has is shaped like a gun: it has a spring that drives the prod. The pigs are little and short.

"I see a cripple with his arms grown to his body down to the elbows. (I am near the centre now.) I see a man fighting with another: he struck at the other with a club, but missed him, and struck a tree. Something good came out; and he is sucking it.

"I've come to quite a swamp, — a thick-tangled place. No man could get through unless he cut his way. I should not like to live on this island anyway.

I see a large snake, with large hooked teeth in front. (I'm travelling east.)

"There's gold in this place, I know; for I feel it, — not far from the surface. I see pieces in the loose earth: they look roundish, but rough. They are in a valley, where there is a stream. Away down, there is a good deal of slaty rock; and I can see gold near the surface in the slate where it has split. It looks very pretty there. I never knew that gold was in slate before.

"I see nobody round here. There are large openings in the woods, where nothing grows. I don't see the cause of these patches.

"I've come now to quite a place for people. There are white folks here too. Woe to them if this place catches fire! if one goes, all go. I see rocks on their houses to cover holes. You would laugh to see them.

"I see some of the queerest-looking old women I ever saw, jabbering to one another. One hit another with a big stick on the back. You ought to see them dance around! Why, the people have some good hatchets here! I wonder where they got them. There are a great many wild fruits. I see them on the floor of the houses. The people sit on the floor. They fight a great deal; knock each other round."

(1.) A granite range of mountains, about four miles from the northern shores of the island, extends about eight miles, and rises in peaks to a height of five thousand feet. An elevated table-land comes close to the sea at the western extremity of the island; and this was probably what she described as a rocky coast as she approached it from the west. "Large tracts" of

the island consist "nearly of bare rocks;" and the eastern and south-eastern part of the island is low.

(2.) "There is no place which can be called a town. The capital is Tamarida, which is built not far from the northern shores, and consists of about a hundred and fifty straggling houses, of which, however, only one-third are inhabited."

(3.) "No European, in modern times, has spent a whole year in Socotra." *

(4.) "In the valleys through which the streams flow there are extensive groves of date-trees, and numerous enclosures of dukkum, and some plantations of indigo and cotton, which are all in a thriving state." *

(5.) There are two distinct classes of people on the island, — the Socotran Arabs, who live near the coast (they are traders and agriculturists); and the Bedouins, as they are termed, the aboriginal population of the island, who live in the interior, frequently change their abodes, "and inhabit the numerous caverns which are found in the limestone hills of their country." * There are also a few negro slaves.

There are no monkeys on the island; but there are "wildish men," as she seems to have supposed; and, as far as I can learn, her description is true to the letter.

VISIT TO THE INDIAN ARCHIPELAGO, OCT. 17, 1869, HALF-PAST FOUR, P.M.

A map of the eastern hemisphere before him, I said to Sherman, "Go east till you can see the sun rise."

* Penny Encyclopædia, art. "Socotra."

"I am crossing the ocean. It is terribly large. I can see a vessel. It is quite stormy where I am now. I can see some beautiful sea-weed.

"I have got to land now. It is very dark here. The place is inhabited; and I can see lights in the houses.

"Now it is morning. I am in a strange place. The people have been up for some time; and yet the sun has not risen. I see some beautiful places. I see some great public buildings like churches. The people look like Chinese; only their hair is not shaved off as close as theirs is represented to be." ("Go south from there.")

"It is misty where I am now; and the air is bad to breathe. I see mountains here that are very rocky. Some seem made of a great many, — one on top of another. There are trees here that look like the palmetto.

"I see a lake without an outlet on a table-land. There are banks built up to keep it from running over.

"I have come to a large body of water. It must be the ocean. It is salt.

"I am up so high now, that I can see Europe, the Mediterranean, and the British isles, again.

"I am on the ocean, where it is night now; but I don't know where I am." (Looks at the map.) "There's a bird in the air just as high as I am.

"Now I've got to morning; but it is not daylight.

"I am to those large islands south of Asia now: they are all sorts of shapes.

"I see some very handsome birds, — one that looks as if it had four wings: the feathers stand out from the

shoulders. It is very handsome. I hardly ever saw any thing so pretty (1). I see others that stay in the long grass, and make a screeching noise.

"There is a large turtle here, that looks like a rock with green moss on it; and a bird, spotted black and white, that lives on red seeds.

"It is getting lighter. I am going up. I can see lightning beneath me sometimes.

"I can see the island I was on. It is a real crooked island.

"I can see New Guinea now, — the whole form of it, — and Australia too.

"It looks real green here. Now I can see clouds between me and the ground: they look like holes in the ground.

"I see some very large birds, with necks all red like the wattles of a turkey. The birds are jet-black. They have large toes, and thick, rough scales. They look like vultures (2).

"I see a long nest hanging out of a tall tree. It is woven together, and is almost large enough for a man to get into. There are two brown eggs in it.

"The sun is rising" (twenty minutes past five). "I should not like to live here. There are a great many snakes.

"Those black birds look as if something had skinned their necks. They have wattles. There is a white kind of owl here, very large (3).

"I see a bird with an under bill hooked up, and the upper one hooked down and crossed. It eats berries.

"Oh! I see a very pretty blue bird, — as blue as can be. I never saw any thing prettier. It looks

proud of its beauty. The birds have very curious bills: some of them are very thick. I see none like American birds. They are *so* pretty! — tails and feathers and every thing.

"I see one building its nest. It pulls over branches, and breaks them off; and is very busy. Its claws look like hands. It has a red throat and a very thick bill.

"The air is full of birds in some places, and so beautiful! I should like to stay here a while.

"Some birds have top-knots red and blue: their long bills curve up at the end. The proudest bird that I see here walks on the ground. It lays its feathers down; and they rub on the ground as it runs a little way and stops. The feathers are worn. It eats snakes. I see it attack one."

After supper, he continued his descriptions: —

"I am to the ocean. I am across it. I can see Australia. I can see New Guinea. Now I am down to it. I am in the same place. Those red-necked birds are here. I see some splendid ferns. Here is a great spider eating a bird. I never saw such a spider. When it is spread out, it is as large as my cap. The bird was on the ground. It bit it and killed it, and dragged it out. (I can see the dew on the grass plain.) It does not eat the bird, but sucks the blood out (4). It is interesting to watch it. If any thing touches its back as it walks along, it hugs itself up in an instant. The sun looks red in the morning there, and larger than it does here.

"I see a large animal that looks something like a cow; but it has a hump on its back (5). There are grassy places: it is not all wood.

"I see a large bat now, hanging down on a bush. Its eyes are shut, and its wings doubled up. It looks like a large rat (6). The birds make a great noise, screeching and yelling; but the bat does not seem at all disturbed by it.

"I see some very large toads come out of their holes, and five or six snakes, all in one clump. This country seems rough and rocky." (Look at Australia.)

"I see a volcano there; a furious one too (7). The country here is rough, — nothing but woodland. It does not look as if man had ever been here.

"I see a large river, and a large body of water, like a sea, in the centre of Australia, that it empties into. I never saw any thing as salt. It is almost thick with salt. It must be thirty miles wide, and fifty or sixty miles long. It is not very big, but very low down (8). There are mountains all round, — a circle of them. It is rocky and barren round there. In some places the country is barren; and, in others, nothing but woods."

After looking over representations of various birds, he recognized parrots and cockatoos as just like some of the birds that he saw, and the superb bird of paradise as one of those described. He said it was mostly blue, but showed different colors.

(1.) This was evidently the superb bird of paradise; and the propriety of his statement, that it "looks as if it had four wings," will be seen by any one who has ever looked at its figure. Of its beauty and form Wallace says, "The ground-color of the plumage is intense black, but with beautiful bronze reflections on the neck, and the whole head scaled with feathers of

brilliant metallic green and blue. Over its breast it bears a shield formed of narrow and rather stiff feathers, much elongated toward the sides, of a pure bluish-green color, and with a satiny gloss. But a still more extraordinary ornament is that which springs from the back of the neck, — a shield, of a similar form to that on the breast, but much larger, and of a velvety black color, glossed with bronze and purple."*

(2.) This must have been some species of the talegalla, which is found in Australia and New Guinea. One species, the brush-turkey of Australia, "is a large bird, about the size of a turkey, with blackish-brown plumage." It is sometimes called the New-Holland vulture, "on account of its naked head and neck, covered in part with fleshy wattles." The toes are said to be "long and strong," and "the tarsi covered with scales in front."† I am not aware that this particular species has ever been found in New Guinea; but others belonging to the same genus are known to inhabit the island.

(3.) Owls are found in all parts of the world; and a white owl, very closely resembling the barn-owl, has been found in Australia. It is not, therefore, unlikely that it, or some allied species, may exist in New Guinea, the fauna of which resembles so closely that of Australia.

(4.) Many large spiders prey upon small vertebrate animals. The mygale (a large spider of Surinam) is known to catch humming-birds; and the galeodes (an enormous spider, that is quite common in India) has been seen to kill lizards and bats.

* The Malay Archipelago, p. 564.

† Chambers's Encyclopædia, art. "Talegalla."

(5.) This must have been the zebu, or Indian ox, which has a large fatty hump on the back, above the shoulders. It is found in India, China, and the Asiatic islands generally.

(6.) Probably the colugo, or flying-fox, which resembles a bat, and hangs during the day suspended from the branches of trees. It is found in many of the islands of the Indian Archipelago.

(7.) I cannot learn that any volcano has ever been discovered in Australia; but a large portion of it is yet an unknown region.

(8.) It is quite probable that such a salt sea exists in Central Australia. It is said that along the western coast, for nearly seven hundred miles, not a single drop of fresh water is poured into the ocean; and it has been thought probable that an interior basin exists below the level of the ocean, like the basins of the Caspian and the Dead Sea.

THE DEAD SEA.

The Dead Sea is an interesting locality to the scientist as well as the Christian. Having a fragment of asphaltum from there about the size of a pin's head, I gave it, several years ago, to Sherman for examination. Of the place he knew nothing, or very little; and nothing of the specimen.

"I see a very large swamp. A dark-looking rock goes down into it. On both sides are mountains high and steep. Where the swamp is, it is very low land: the rest is high. The water is covered with green vegetation: they call it frog-spittle. I see a kind of

lizard. On the mountains there are bushes. A stream runs into the swamp from one side, and another from the other side. There is one place where it is very miry" (1). ("Taste the water.") "I don't like to, it is such dirty stuff; and there is blue oil over it (2). The taste is very bad, like bitter medicine: it is as bitter as bitter can be (3). It is black-looking. I went on top of the mountain; and the swamp looked like a speck, the mountain is so high. One of those creeks starts from a lake in the mountain, under the ground. It comes out of the side. (When I roll this about on my head, it looks as if the world was rolling about.)

"Now I see a large river running into that swamp: it has cut its way through the rock. It seems to run between those two ranges of mountains. There is any quantity of fish in that river. The water is good, like any other water (4). I see a fish, something like a pickerel, about eighteen inches long, standing still in a deep pool." ("Go up that river.") "I get out to a very pleasant place, where there is grass growing, and horses feeding. The river looks a good deal smaller. I see a little spring bubbling up, with grains of sand in it.

"That swamp is very large and very deep, but miry in some places. It seems very lonesome. It does not seem as if any thing lived there" (5). ("See what the country is like down the valley.") "There is a place away down where water has worn the rock, and left a natural arch. By this time it may be down. The country is all lonesome and desolate. I should not like to be left there.

"I come to a large body of water. It is salt. I cannot see across it." ("Cross it.") "I've crossed it. I had not time to get sea-sick. This is pleasant. I see some negroes; but things look foggy" (6).

(1.) I think this description refers to an ancient period in the history of the Dead Sea, rather than the present time; though the southern shore is "low, level, and marshy;" and along the eastern and western borders "are lines of bold, and in some cases perpendicular cliffs," rising to a height of from one to two thousand feet.*

(2.) This may have been a time when free petroleum existed on its surface; the asphaltum found there to-day having, without doubt, been formed from it.

(3.) The nauseous and bitter taste of the water has been noticed by all visitors. This is owing to the great amount of magnesium compounds contained in it. In one gallon of the water, weighing twelve pounds and a quarter, there is no less than two pounds of chloride of magnesium.

(4.) The River Jordan, which flows into the Dead Sea, answers very well to this description.

(5.) The neighborhood of the Dead Sea, as is well known, is one of the most desolate regions in the world.

(6.) The sea crossed was, I think, the Red Sea; and the country beyond was Africa, where he very naturally sees negroes.

* Chambers's Encyclopædia, art. "Dead Sea."

DEAD SEA, OCT. 9, 1870.

About a year after this, Sherman visited the Dead Sea again, after looking at the map of Palestine.

"I am to the end of the Mediterranean, and now I am there. It is very rough now: it is white all over. The waves splash so, it looks like the water behind a steamboat. The wind blows so, the trees bend right over. The country is rocky and mountainous, and very, very hot. I think it would bake clams in the sun. There are a great many stumps of trees in the water where I am" (about the centre, on the west side). ("Go back gradually, and see what it was like long ago.")

"I am where the waters ran into the sea once, — the Mediterranean Sea" (1). ("Go back slowly.") "It was much higher once, — on a sort of table-land, I should think, — and sloped from here to the sea. Now I suppose the Mediterranean would fill it up, if it could be got in. After that, it kept sinking down. There were a great many fish in it when it was on that table-land. I do dislike this place (2).

"After it begins to sink down, I see bluish stuff on the water, that has a very bad, poisonous smell: it seems to be on fire, and a smoke rises from it. It dies down, and comes up again. The water is all covered with various colors, like oil on water. At some distance, it looks like a great fire" (3). ("Come slowly to the present time.") "It was not long burning so." (Pause.) "I can see it sinking all the time; and I think it is sinking now; and the sea seems to be getting deeper and smaller. In the middle it is very

deep. It is a long crevice in the valley that the water is in (4).

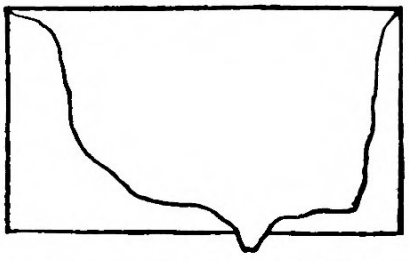


FIG. 2.—Section of the Dead Sea in the deepest part.

"The people here are brown; and most of them have a thick cloth round their heads, and long pipes that they smoke."

(1.) Looking at a map of that portion of the country, the most natural thought is that the Dead Sea must at one time have been a continuation of the Red Sea, from which it was separated by an upheaval of the land at the head of the Gulf of Akabah. Ehrenberg, however, ascertained that not one of the foraminifera found in the mud of the Dead Sea belongs to any species found in the Red Sea; and it is not, therefore, probable that it was ever connected with that body of water.*

(2.) Indications exist that there was once a table-land in the vicinity, and that the Dead Sea stood at a much higher level.†

(3.) The sinking of the region may have been connected with sufficient volcanic disturbance to set fire to the petroleum, which must at one time have been very abundant, judging from the asphaltum still found

* The earth, Reclus, p. 409.

† Sea, the salt. — Smith's Bible Dictionary.

in the vicinity; and this may have given rise to the Jewish traditions connected with this locality.

(4.) Fig. 2 is a tranverse section of the Dead Sea in its deepest portion, plotted from the soundings given by Lynch.* The crevice has a depth at that point of 1,308 feet, or 2,624 feet below the level of the Mediterranean; while the length of the Dead Sea, forty-six miles, — only a portion of it, — shows it to be a "long crevice."

ANCIENT PALESTINE.

The following is a description given by Sherman from a specimen of cretaceous rock from Palestine, and may be a picture of the country when its topography was strangely different from the present. It seems to indicate the tertiary period better than any more ancient time.

"I am by a river now. It is very shallow, and about a quarter of a mile across. I can see pebbles at the bottom all the way. It is not over ankle-deep. I tell you, this is a beautiful place. The river overflows sometimes. I can see the high banks. It must be deep sometimes. I can see the ripples in the stream. It runs fast. There are pretty white animals that run out of holes in the ground.

"Some distance down the river it grows smaller and deeper. There are many fish in it, and splendid birds round it.

"I can see a mountain away off. It has been a volcano. I can see the crater and the lava-streams;

* Sea, the salt. — Smith's Bible Dictionary.

but they are broken up. Where the land goes down suddenly, the lava dropped, and cooled in tubes like icicles. They are white inside, and black outside. It was in the bank of the river. I think it must have made the river boil. There is black rock in the bed of the river, smooth as can be where it ran.

"This is a beautiful country. I should like to draw it. I see trees that look like palms: the branches are all on top. This seems to be a pretty mountainous country. The mountain seems to grow higher as I get farther from it. How can that be? As I go along so fast, I feel the breeze on my forehead.

"Why, the river goes to nothing almost as I go down; but it is deeper. Now it has gone down entirely out of sight. There is an arch where it goes down; and it runs in a cave. I can see a little light away off. There are multitudes of lizards in that place, crawling everywhere. Some are six or eight feet long, and some are not more than two inches. In one place under here the river is a mile wide. There are flies, and fish jump up. In some places the walls are white as snow, and they smell very poisonous. The cave is straight; but the river winds about farther down. There is a grand echo here.

"The opening is larger where I am now. I see lizards crawling on the side, yes, and on the top, with their backs down. There is a reflection from the white roof into the water. When there is a noise, a thousand lizards pop their heads up out of the water.

"I have come out now. There is a waterfall; and the river pours into a large body of water, over a cliff a hundred feet high. The water it flows into is salt.

There is enough wood on an acre of this shore to last a man for years. It is covered with wood. You could walk five miles without stepping off a log. When the wind blows, it drives the spray on to trees; and I can see them white with the salt. There are a great many dead animals lying on the beach. *So* many kinds of skeletons of lizards and snakes! The lizards don't live in this salt water. I see fish with very large heads,—nearly all head. Plants lie on the shore that do not grow here, but have been washed down.

"There is a plant here, like the sugar-cane, that grows forty feet high. The juice squeezes out easily, and it is very sweet. It grows so thick, nothing could get through it. It is near the shore, and grows for miles, and crowds out every thing else. You could not read writing at noon in there, it grows so thick.

"I see where there is a lizard that had been trying to swallow a little one, and died before it got it down. The hind-legs and tail are sticking out of its mouth. I cannot take a step but fish dart out. I see large ones in a salt-water puddle. There are pretty birds going over. They sit on the water as if it was land. They eat one kind of fish; and they dive after it, with their eyes open, ten feet deep. I should think it would salt their eyes up.

"There are sea-weeds fifteen feet long. They are the color of brick, and have bladders on them that crack when you break them. The sea-weed covers the rock. When I lift it up, I see crabs and little eels and little fish. Some of the crabs have shells on them. They stick tight to them, as if they had grown there, and it was part of the crab. Some of the crabs are eighteen inches long, and of an oval shape.

"I notice a great many snakes as I go along the shore. There are some perfect skeletons of very large ones.

"I see a great whale in this sea. He opens his mouth, and the water goes in like a mill-dam. He sends the water very high. Such a lot of fish as he takes in!—enough to fill this room,—and takes them just like a bite. He has them in his mouth, and sucks them down gradually."

"Go up and see how long the sea is."

"I seem to go up a mile at a leap. I see things grow smaller. I can just see the whale like a dot. I can only see one side of that sea. Now I see peninsulas that I could not see before. It looks like a map. The land looks smooth, and the ocean is smooth as glass."

DEAD SEA AND ANCIENT JERUSALEM.

Some two years afterward, I requested him to visit the Dead Sea and the surrounding country, and describe them. This he did after looking for a little while on a map of Palestine.

"I can see the waves dashing. I am along the beach somewhere. I can see land on another shore: I think it is Africa. I can see Spain now. I am going along the Mediterranean. I can see the eastern end of it. I am down there now." ("Go east about thirty or forty miles till you see a river.") "I see a river — quite a large one — that runs north and south." ("Follow it down.") "I have come to a large lake, and a little bit of a stream beyond it. I see large trees and vines there: many streams run into it, and it swells and diminishes (1). (I see some dark-com-

plexioned people that have thick lips.) I am down to that big lake: it looks blue. It looks more as if I was by the ocean than by a lake. The water is salt: it tastes like a bitterish salt. It is swampy round there. There is greenish stuff on it. I don't see a single thing in it."

"Try to find that city," I said, showing him Jerusalem on the map.

"I see some mountains, and some city or other. Why, this looks something like Egypt! I see some great buildings, like temples, very high: when I am on the top, the people look very small. I see the ocean from here (2). The people are busy. They wear broad-brimmed hats, and have a long mustache and beard. The streets are hard paved; and some of the houses have square tops and flat. I see some buildings of stone that go up to a point."

"Go back in time about two thousand years" (3). "I do not see any city." ("You are too far back.") "I am back now just two thousand years. The city is a great deal larger. They are fighting now. They have a large machine that sends great iron arrows: they would go through ten men at once (4). They have another machine for throwing stones. Men on a wall are shooting arrows with bows. They have a great many arrows apiece.

"I saw one of those arrows go through three men. It carried them down, and stuck in the ground. I see them making the arrows. They have wood, and put sheet-iron round the point, and hammer it after heating it. It scorches the wood inside. The attackers will get beat. They fall down the wall every time."

I asked him if he knew what city it was, and found that he did not.

"I see a very large volcano away off to the east (5).

"I see some people now. Such houses! They climb to the top with a ladder, and then take it in."

(1.) In winter, owing to the great amount of water poured into the sea, and the less amount abstruded by evaporation, the water stands some ten or twelve feet higher than at other times.

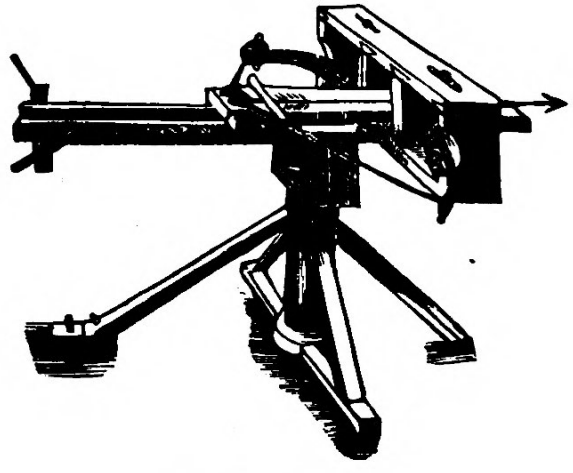


FIG. 3. — Catapulta.

(2.) This I did not think, at the time, could by any possibility be true; yet Josephus informs us, that "from the tower Psephinus, outside the walls, could be discerned, on the one hand, the Mediterranean Sea; on the other, the country of Arabia." * This, however, like many of the statements of Josephus, probably needs to be taken with some grains of allowance.

(3.) I did not suppose, of course, that he could do

* Quoted in Smith's Bible Dictionary, art. "Jerusalem."

this exactly; but I thought it might assist him in seeing it at an interesting period of its history.

(4.) The machines for throwing arrows and stones, — the one which is represented by the figure, the catapulta; and the other, the ballista, — we are informed by Plutarch, were invented in Sicily about the year 300 B.C. "They are mentioned in Cæsar, Cicero, Livy, Seneca, Tacitus, and other writers; and were employed in great numbers by Titus at the siege of Jerusalem."* The early chroniclers tell us of catapultas that would throw an arrow half a mile. Josephus frequently refers to them. Many of them were used by the Romans in the siege of Jerusalem, and some of them by the Jews to repel their attacks.

(5.) This was probably the volcano of Demavend, whose height is twenty thousand feet, that lies at a distance of about a thousand miles from Jerusalem, and due east of it.

THE EARLY SETTLEMENT OF JERUSALEM.

With a picture of Jerusalem before him, he made another psychometric examination of the city a few days afterward.

"I am there now. It is morning, and very still. I see some holes in the wall, like holes in forts."

("Go back in time.") "I am back. I see another war now. They are building the wall: they have got most of it built. Some are building, and some are fighting. They fight with their hands mostly. They throw stones. The people of the city get on the wall, and

* Penny Cyclopædia, art. "Artillery."

throw stones down into the valley. The others are trying to get up the wall. I see an animal like a mule bringing up stones by the cart-load (1).

"They have a curious way to throw stones. There is a wide plank fastened at one end: they bend the other end down, and put a large rock on it, and stand on it; then they jump off, and away the stone goes."

("Go farther back.") "It is a very old city. I am back to where the place is all covered with trees; and there are just three people. I see them chop down trees, and make a log-house, flat on top; then I see where they chop the logs on the side, and make more decent houses. Now they make them thinner, and with frames. Now I see a machine for sawing them; then they make some of stone; and now there are a great many. The people live by hunting mostly. They don't seem to raise much: it is too rugged, rocky, and hilly.

"Now I see them fighting people that look like Indians (2). They are trying to keep them out of their houses: they form a line round them, and throw stones. They have bags, out of which they throw. There is a great heap of stones in the middle of the place. One man threw a stone that took a piece of a man's cheek off, and hit another. They have their arms naked to the shoulder. They are muscular people, and are dressed mostly in skins. Those that attacked them are running.

"There is a larger body coming now. On that stone heap is a watch; and they can see for miles (3). Men are carrying stones to heap near their houses. They have killed a good many of the attacking-party now,

and wounded more. I see some of them with scars that they got when they attacked them before. They are whipped again. They are running off now.

"I saw ten of them throw at one man at one time, and then at another. How they do yell when they hit!

"Now there are as many as three thousand coming, bringing stones with them." They have gathered all for about two miles back. The people in the town don't seem afraid. Both sides know how to throw stones."

(1.) This must have been long before the city fell into the hands of the Israelites, and long before engines of war were invented.

(2.) Probably related to the Berbers, or some other of the dark-skinned races of Northern Africa.

(3.) The elevated situation of Jerusalem, which is a constant theme of exultation with the Jewish writers, was probably one reason, if not the principal reason, why it was first chosen as a dwelling-place.

HEART OF AFRICA.

The following description of the interior of Africa is certainly more accurate than any boy of thirteen could give (the age of Sherman when this was given) without considerable reading and thought; neither of which he had practised or given.

"I am in Africa, — about the centre. It is a rocky country, and very mountainous. The mountains are high; but I see no snow on them. There are a great many lakes round here, some of them salt. Rivers run from some of the fresh-water lakes. They are full

of fish. There are many curious birds here, different from any I have seen before. I see one with a body about a foot long, and a tail of three feathers about six feet long. It has a top-knot. It is a brownish bird, spotted with white. It does look strange when it flies. I see no people here. It is a wild country. There are large clumsy birds that scrape the dirt in search of something to eat. The only water-birds that I see are cranes; and they are different from those I have seen before. I see a good many weasels." ("Move south a little, to a more level country.")

"I have. It is quite marshy; and there are a great many water-birds. Some look like geese; but they are twice as large. They have a brownish-white body, and dark wings; and a black neck, with a ring of white round it. They look splendid in the water. They eat fishes.

"I see some people that look like black negroes. They have spears, and bows and arrows; but they shoot each other instead of animals. Most of them are wholly naked. I see little boys practising with spears and arrows in sham battles. The ends of the spears are stones: they are well done. They throw and stick them into trees for practice. They throw stones well. I saw one throw a stone at a monkey, and nearly brought it down. Their noses are very flat, and their faces ugly. They look a great deal worse than the negroes do here. Their heads are very bushy: a great deal of hair on them. I see white rings through the noses of some. They actually make a sore place by hitting when they run. I saw one fellow throw a spear, and break the point: he took the spear off, and

threw it away. They throw with great force. The stick quivers after it strikes. They aim well with the bow and arrow. They shoot those scraping birds with their arrows. The bird will run a little distance with an arrow through its body. The women practise, too, as much as the men. They have arrows as tall as I. Some of their arrows are almost as clear as glass.

"Their huts are made of sticks bent over. I can see twenty or thirty people in a place no larger than this room. How it stinks! I would rather live with the bears. They don't eat the people they kill; but they will cut a man to pieces, after he is dead, to get an arrow out. Their arrows are made of wood, with a slit in the end, that the sharp stone is let into; and then it is tied with what looks like some kind of bark. Their huts are conical: they have skins inside.

"I see a party of their enemies: they are having a fight. One arrow came into a tent, and stuck into a skin. They have feathers on their arrows, that seem stuck on in some way."

SPITZBERGEN AND THE ARCTIC OCEAN.

Looking on the map, Sherman gave a description of Spitzbergen in a similar manner.

"I am up to Behring's Strait now. I do not see any ice. There are a great many islands up here. I think I am at Spitzbergen now. One of these islands is quite long (1). I do not like it much here. It is storming awfully,—raining; but it is very cold. The wind blows the water on the land. I do not see an animal, not one, nor any person; nothing but rocks. I have come to one place where it is very swampy; and there are a

great many bushes and plants in it. It is raining awfully. Hail falls with the rain: the drops are very large.

"There are no trees here, — nothing but bushes; but they are very thick. I see the knottiest bushes that I ever saw: one looks like oak (2). There is a very large bird, web-footed, with a straight, sharp beak. It has great green legs, and is spotted black and white. It is flying.

"The country is very rough; and the cliffs here go down into water so straight, that a man could not climb up (3). Back in time, this country was more mountainous, and abounded with birds and mammals and fish. One mammal looks like a small pig; but it is black. The climate is pleasant (4).

"Farther back, I see it level where the cliff is. The cliff has risen since (5). I do not see as many animals, and it is not as warm; but it is pleasant.

"I have come to a time when it is very warm, and there are lots of plants, — a great many ferns, and very large, — but not many animals. I see some small black land-birds. The islands were much smaller; but, before that, they were a great deal larger.

"It is not far to the ice from that island now. But it is only in thin, scaly pieces. I hear them as they strike together. A ship could go through it. I see a ship going up now; but the ice freezes on the side of the vessel. They have logs fastened with ropes to bump and knock the ice off. I see the flag of the vessel. There are two bands from the corners, that cross in the middle: one is red, and the other is blue; and the flag is yellow. It is torn. They are trying

to go up to the north pole, I think. They are past the storm. The captain is looking from the mast for ice or land. The sailors have broad faces. (There is an eagle with two heads on the flag. — 6.) They are going along at a great rate, the wind is blowing so hard. There are a great many birds and animals where I am now, — mostly birds; a few seals. I see one man harpooning a seal.

"If they could push on through the thick ice, which is about a mile wide, they could get to the open sea; but they will stick before they get there."

(1.) The largest island must be over three hundred miles in length.

(2.) All authorities agree that there are no trees in Spitzbergen; and they also state, that, of the forty species of plants that grow there during the short summer, the most tree-like are but a few inches high. Bushes such as he describes have never been observed, but may exist in some favored spots.

(3.) "Many branches of the mountains run westward, and come close to the shore, where the abrupt termination of the mountain-ridges projects beyond the regular line of the coast, and overhangs the ocean." *

(4.) That the climate of Spitzbergen was once milder, and that the country abounded with animals, there can be no doubt in the mind of a geologist. This was the case with Greenland, as Heer's researches have demonstrated; as also with Nova Zembla and other islands north of Siberia, as abundant remains sufficiently show.

(5.) I. Lamont, who visited Spitzbergen in his

* Penny Cyclopædia, art. "Spitzbergen."

yacht, found drift-wood, and bones of whales, several miles inland, and at least thirty feet above high-water mark. This indicates that the island has risen recently, and with great rapidity.

(6). The description agrees with the Russian flag better than any other; but the coloring is different from all that I have seen described.

NORTH POLAR REGIONS.

Open Sea and North Polar Island. — Those who have read the first volume of "The Soul of Things" may remember that Mrs. Denton described an open polar sea as existing in the vicinity of the north pole, and land in it free from ice and snow. The heat in the vicinity seemed to her to come from the interior of the earth. While the first volume was in press, I gave to Mrs. Cridge, who had not read Mrs. Denton's description, nor heard of it, a piece of granite brought from St. Mary's River, fifty miles from the North Polar Sea. She said, —

"The land looks high. It is fenced off. I see steam-works; but do not think this came from there. I see metal in the earth, and uncovered. To the north there is water and a cliff." ("Go to the north.") "What an immense cliff! It will take me some time to get down. I see sea-fowl. Away off to the north, there are two projections into the water. I see a boat with two men in it. How desolate every thing appears! The land is quite low there. I see a white animal with dark eyes and long shaggy hair." (Turned the specimen over.)

"Now the scene has changed. I see multitudes of floating icebergs, — fields of ice. It is intensely cold here. Now I see a current of water, which seems to flow from the north-east: it reminds me of the Gulf Stream (1).

"Now I am wandering on ice. It is ice, ice, all round: there is nothing else to be seen. I am travelling north-east. How dark it is!

"Now there is a little light, like the sun just rising. It looks singular, — the heavens dark, and the sun just peeping over the ice. South and west it is all dark. I do not travel fast now. It seems as if I could go no farther (2).

"Now I advance a little. That is strange! Here is the sea again beyond the ice. It is open off to the east, and seems like a river. Now I am going up that river. The ice looks like rocks. Back from the river are hills and pyramids of ice (3). It goes east and north. That must have been open all the way up at one time. Here is the open sea: it looks very dark. The ice seems like land. The water is smooth and quiet. There is a rusty knife on the ice, without a handle: it has been a table-knife. I can go easier and faster over the water than over ice. Here is land. I see a little hut, and the smallest people I ever saw. Oh, ho! what funny-looking people! so stumpy! The ground looks green: it is mossy. One hut I see quite near the water. I cannot see as distinctly as I wish. Where I saw the people the land is flat, and extends into the water. But north there are high rocks, that seem to be pure metal almost: it looks like copper. The open water goes off east and north; and then

comes the ice again. North-east the water narrows, and it is all ice again. My spirit does not like to go that way: it wants to go by the open water. The sky seems low and heavy. All is dark again. It is all ice for a long way.

"Now there is water. I wonder if that is not the pole. How still the water is! I see no land there. It seems like an open sea, which does not seem to be over two hundred miles across; for I can see all over it. It is not as cold as it was. The water is not cold, but pleasantly warm. I wonder how that is. It impresses me as if the heat came from under the water. I saw a fish dart across. What curious fish! What a singular shape! They are long and slim, and have large, bright scales. How clear the water is! I can see the sand at the bottom."

("Are you sure there is no land?") "I will look. It is not light enough for me to see now. Now it is lightening up, and I can see stars. I believe I am at the pole. Yes: there is land here. I am now going round it on an exploring expedition, — sometimes on land, and sometimes on water.

"I see a place where the water has run down and cut a deep gully. And here are what look like trees. Yes, they are evergreens: they look old. One has a leaf, half an inch broad and an inch long, shaped like a holly. Another is a pine, with long, spiny leaves. There are little black animals about the size of a squirrel. Behind those trees I see another animal indistinctly, about as large as a sheep. It has horns, and is covered with long, very long hair. I see no human beings here. It is lonely and desolate; never

trod by mortals. There is more light here than elsewhere. Overhead is what seems to be the north star, and a light rising continually, apparently from the water. It must be a current of electricity. It gives light continually; so that it is lighter here. There is a great deal of metal here that I think must be iron."

(1.) Mrs. Denton described a very similar current. She speaks of a broad channel in which she could see water moving down — that is, towards the south — as she went up.*

(2.) Mrs. Denton says, "I keep coming back; and it requires great effort to go forward." Why it should be more difficult to travel in this way to the far north than in any other direction, I cannot conceive. Sherman does not appear to have found any such difficulty.

(3.) Mrs. Denton says, "There is a slope back from the water; then the ice rises in peaks."* Both reach the open sea, after proceeding up what seems to have been the same channel.

Mrs. Denton made a subsequent examination of the same region: —

"The open sea around the north pole is large.

"I cannot imagine why any animal should live in such a cold and desolate region as this is. It is difficult for me to get away from the ice.

"I do not know where this is; but I am on land, where there are the most beautiful birds I ever saw, richly colored. They seem more like tropical birds than those of this climate. They are almost all colors; but they are principally green and red, and striped

* Soul of Things, vol. i. p. 141.

obliquely across the wings and back. The colors are rich and bright.

"Some of them are eating a kind of fruit that resembles a cherry; but the meat is thicker and harder, and there is considerable difference in taste.

"I see a long beach and a very long point of land, beyond that an indentation, and then a cape." (Disturbed.)

"There is a deep, dark place that stretches in for a great distance. It seems like a cave in a mountain. There are mountains here quite high, — a circular belt of mountains. As I look down into it, it seems to be a kind of gap between two ranges of mountains or high hills.

"There is a singular atmosphere here. It seems humid; though that does not exactly express it.

"I see a shrub about fifteen feet high, all covered with fruit. I think it is the same kind as I saw the birds eating. It bends over with the fruit.

"I can see those hills stretching off to a great distance.

"The edge of this land is very much indented by water.

"There is a low place where a curious steam is rising, and there is a singular smell. I do not like this atmosphere. There was something like this about that deep place I looked into, — a sulphurous smell and a purplish hue, which I noticed when I looked into it. There is a similar condition all round here.

"That tree is slender, and the branches are slender; so that it droops a good deal with the fruit.

"I am away back now over the snow and ice. Oh

the mountains of snow! I did not expect that at all."

She means that she did not suppose that she was at the polar region till she discovered this to be the case by the snow and ice that she encountered on her return.

That there is an open polar sea, and a region free from the ice and snow that characterize the arctic regions as far as we are acquainted with them, I have no doubt; though I certainly did not believe it previous to these psychometric explorations.

INDEPENDENT TESTIMONY OF A WARM POLAR COUNTRY.

I was desirous of having further independent testimony of the existence of this remarkable region; and in 1869 I induced Sherman to visit the extreme northern region of this continent, having before him a map of North America. I knew that he had not read the previous examinations, nor did he know of them; while I had good reason to believe that he had no idea of the existence of an open polar sea.

"I can see Boston and the sea. Boston looks smoky." (Examined the map.) "I can see Florida now. I am up so high, I cannot see Boston at all. There are no clouds above me; and those below are like spots on the earth. The ocean is blue,—very blue. I am travelling along to where it gets cold. I see ice now; but, when I get down, I cannot tell where I am. I see Baffin's Bay; but it does not look as it does on the map. I see a point of Greenland that is not on that map. If this is Greenland, it is a great place. I cannot see any thing but blue and white. When I am away up, the

land looks blue, but not as deep a blue as the ocean. I keep seeing more land, as if it grew before me. I have got to where Greenland stops. It is an island, and has a few islands north of it. I see a great difference between that and the south end of it. It shades from white to blue. There is a bay in the north.

"I can see the world turn round, I am up so high.

"It does not look so white farther north as it does farther south. It is water. It does not look as if there was much ice here. Look here, pa! It does not look as if it was as cold as the rest around it. It stops farther out (1). It is frozen. It is very irregular. I was up a good way.

"Why, this water is not cold! — not near cold enough to freeze. I can barely see the sun. There are even animals here! I see some in the water, — some kind of fish. The ice melts in this."

("Is there any passage open from that to the Arctic Ocean?")

"I believe there is a place where there is a passage; but it has been frozen, and is just now melting. I can see the ice melt." (Thinks the passage is round the north of Greenland, east.)

("See if there is any land in that open sea.")

"There is, — as much or more than Massachusetts; yes, as much as New York. It is very rugged, and heated. It seems as if there was something volcanic about it; for the ground and water are hot, and not the air. I sense a good deal of iron about here. It seems excellent iron. I see no men around here; but I see lots of whales, like islands, floating around. There is a ridge of mountains running through the

middle of that land, very rugged. I see vines with berries on. There is a lake of fresh water, with outlets to the ocean.

"I can see long-necked birds that look like fishing-birds. They are great divers. The water spouts out of their nostrils when they come up. It is a beautiful place when you get back to the centre. I see trees larger than any round here. It is as warm as a man would want to have it. I can see little animals like monkeys. They have long claws on a hand like a man's. They feed on the fruit of those tall trees. It is as large as a plum.

"From the ground the sun seems to be almost setting where I am. I see squirrels gathering and eating nuts. They are a very large kind, — some gray, and some a little red. The largest kind is gray, and lives in trees. There are nuts that grow on the ground. The centre of the island is fertile as it is here, — more so. It seems almost tropical. There are dogs, and an animal about the same size, that looks like a deer. I see no polar bears here. It does not seem to be heated by the sun.

"There are some very high mountains; but there is no snow on them. There are a great many kinds of birds. It seems as if it was heated by something underground."

At a subsequent excursion, he described a body of land lying to the north-west of Wellington Channel, and extending "to where it is warm."

(1.) I suppose he refers to the icy shore on the other side of the open polar sea.

The attentive reader will observe many points of

agreement between this and the previous statements with regard to the same region where actual explorations have not been made. It is only by independent examinations that the truth in reference to such unknown regions can be learned. A wonderful story might be told by any one; but, where such harmony is found in the statements of independent psychometers, I think there must be a basis of fact upon which all are built.

Soon after, he visited the locality again.

"I'm going up very high. After getting up, the night does not look so dark. I can see the difference between land and water: the water looks white. I can see the sun now: it is setting.

"Now the sun is away up, I am so high. I can see one end of Greenland now. Now I see about half of Greenland.

"I can see that place now that I saw on the map" (Lancaster Sound). ("Go down and see it.") "There are a great many icebergs floating round in it. I notice a wide channel going to the north-west; (Wellington Channel?) but it turns to the south, and then north again, where there seems to be land, and I lose it. It is frozen in the upper part solid." (North of Parry Islands, he says there is solid land.) "There is not much ice in Mellville Sound now. Well, I declare! — that land (land north of Parry Islands) goes up to where it is warm. On the western side, there is a channel between it and some other land: and then beyond it there is no ice at all; it is warm.

"It is all icy south-east of Victoria Land. What is the reason that there is more ice there than there is

farther up, where it is all free? I see ice all along on that line (67° north latitude).

"Salt-water ice looks strange; and it tastes strange.

"Smith's Strait is not wholly free from ice. I think a vessel might get through among the icebergs. After they got up north of Greenland, they would find it a great deal warmer.

"It is daylight up here in all this northern country."

Five days after, the examination was continued. I said, "Go to the north of Greenland, where you were before."

"I am now where the icebergs are floating down, and the temperature is 35° above zero (1). I am going up that channel. I can see this run down. It is only 10° above zero now; and now it is 10° below, now 30° below, and now more than 40°. Now it sinks in the bulb to half the size." (His height above the surface may account for this intense cold.)

"I am going up that big channel; and it is 10° below here, now 20°, now 30°; and I am nearly to the top. Now it is 40° below. It is awful cold here. It is so cold, the icebergs split in two. Now it is 50° below; and it keeps about that. And now it is 48°: it is getting warmer; and now 40°, and 20°, and now 10° above, as I keep going north. Now it is 30° above. I keep looking as I go.

"It is now 60°; and I am in that warm place,—that open sea. Now it is 62°, and now 70°. I can see land and fish, but larger than those I saw before. There is a school of them,—about a hundred together.

"I am on the land now, and it is 73° here. I can

see the sun much higher than I saw it before. There are trees like firs, that go up very straight to a slender top." ("What makes it so warm there?") "I think it comes from under ground." ("Try the temperature of the water.") "That is colder: it is 64°."

("Try the ground.") "I can put it in the dirt: it is 58° a little way underground.

"Why, I see some people here that look like Indians, and are dressed in skins and furs like them! There are three of them sitting on a rock. They have a kind of dart they throw with their hands. They are of a reddish-brown color. They seem to have a good deal of brain. I see where they have dug holes to trap animals. There are sticks over them, and rods, and meat for them to eat; and, when they go to get it, they fall in. They have small boats and sails made of bark, stuck together with a kind of pitch."

(1.) As an experiment, I put in his hand a Fahrenheit spirit thermometer, and told him to try to obtain from that the temperature as he went along. When his eyes were closed, he said he could see the thermometer in his hand, and read the indications from it as he went along. How much confidence can be placed in such readings, I do not yet know. Very careful experiments need to be made, and often repeated with different psychometers. My opinion is, that all instruments have a spiritual counterpart that can be used by the spirit; and that we shall yet, by their aid, bring all the past within the strictest scientific investigation.

ANTARCTIC CONTINENT AND ITS INHABITANTS.

About four years ago, Sherman, with a map before him, gave the following description of the southern polar regions, which, evidently to his surprise, he found to be as warm as the northern : —

" I can see as plain as day what the people are doing in West Newton. It is raining at Boston. Charles River is very high; and lots of corn-stalks are floating down.

" I am going along the sea-shore. It is very foggy near the water. I hear the waves roar, and see them dash up. How crooked the shore is! I have to get up to see where I am going.

" I see Cape Cod now. It stopped raining just before I reached there. It looks green.

" Now I am on the way down. I can see Florida. It is warmer now: I can feel it hot. It is raining down here. I can see the bay between Central America and South America (Bay of Panama). It is misty, though.

" I have come down, and can see people now. They are putting their hands under rocks, and pulling crabs out. A man is running from a scorpion.

" That isthmus (Panama) is quite small. I am where it is getting colder. It is a very rough place. The mountains seem strange as I look down upon them. I see one volcano smoking away. The mountain-range is very wide there (pointing to Chili). I see another volcano now (in Patagonia) in eruption. It is pouring out lava.

" Those islands are very dim (Terra del Fuego, &c.).

I can see people there. They are so small! not much bigger than I am. They look sleepy. It is real cold here. Some are dressed in four thicknesses of skins round their shoulders and waist: they have only left a place to breathe through and look out of. There is thick snow all round there." ("Go south from there.")

"I find icebergs a little below there. Large balls of ice like big eggs are coming down in a shower. They make the water dash up. Some hit in the air, and crack in two. The water is thick with them.

"I have come to some land away down. It is nearly all mountains. I hardly see any thing but mountains. They are the highest I ever saw. I see some in eruption too. Three are straight along in a line; so near, that they throw stones over to each other. The lava is running down; and the snow flies in every direction. They look pretty in the dark. The heavens are covered with those northern lights. There are two places where they look like comets. I see stars that look red behind them. That land looks as if it went clear round the pole.

"I see five more volcanoes very near each other. Lava is coming down one *very* slowly.

"I declare, it is getting warmer, — just the same as at the north pole.

"Well, I see a man, — a brown man. He lives comfortably; has a house of sticks. I see trees now. (It is very different from the north pole.) There are leaves on the ground that a hundred men could get shelter under. They lie on the ground like young mullein-leaves. There are four or five to a plant.

The leaf is very thin; and the seed is very large (like a cocoanut), but smooth and glossy. A very large seed-bag holds the seeds. It looks something like a poppy seed-bag; that is, on a stout stalk. That man is gathering them. He can see by those northern lights. There are southern lights just as well as northern lights. I never knew that before."

In answer to questions, he said that he did not see much water; and what he did see was fresh. He also said that he saw more people, and that they lived in quite decent houses.

There is a space around the south pole, nearly twice the size of Europe, that has not yet been explored. It seems highly probable that a large continent occupies a considerable portion of this space. More than eighteen hundred miles of the coast of what appears to be such a continent have been discovered south of New Zealand and Australia by Ballamy, Wilkes, Ross, and other navigators. From this land, glaciers protrude into the ocean from five to twenty miles; so that it was extremely difficult for the discoverers to land. No vegetation has been seen on it, and no animals except birds.

CHAPTER III.

ARCHÆOLOGICAL EXAMINATIONS.

THE present we know; or we can learn it, as we have already done so much of it. But the past, we are told, is gone beyond recall; and all that we can ever hope to obtain are the fragments that time has spared, and the deductions that can be fairly drawn from them. But this is a grand mistake. What so many have wished is really true: what the soul has longed for, and almost chided itself for its longing, Nature has provided in her infinite fulness.

"We have often wished," says the author of "Pompeii," "in various parts of England, that we could recall for a moment the ancient aspect of the country; reclothe the downs of Wiltshire with their native sward, and see them studded with tumuli and Druid temples, free and boundless as they extended a thousand years ago, before the devastations of the plough and enclosure acts; recall the leafy honors of Nottinghamshire and Yorkshire; and repeople the neighborhood of Sheffield and the Don with oaks, instead of steam-engines and manufactory chimneys; or renew the decayed splendor of those magnificent monasteries whose ruins still strike the beholder with admiration. If the romantic

fictions of the middle ages could be realized, which tell of mirrors framed with magic art to represent what had formerly passed, or was passing, in distant parts of the earth, the happy discoverer might soon make his fortune in this age of exhibitions. What exhibition could be found more interesting than a camera-obscura which should reflect past incidents of historical or private interest, and recall, with the vividness and minuteness of life, at least the external characteristics of long-past ages! Such fancies are but idle speculations."*

Nothing of the kind. I think I can show that they are sober realities. All that he wished for, and much more, can be done by us. We are the heirs of all the ages; and none of our patrimony has been spent.

Dr. J. W. Draper dares to be so extravagant as to say, "A sunbeam or a shadow cannot fall upon a surface, no matter of what material that surface is composed, without leaving upon it an indelible impression, and an impression which may, by subsequent application of proper chemical agents, be made visible. . . . Time seems to have so little influence on these effects that I can conceive it possible, if a new vault should hereafter be opened in the midst of an Egyptian Pyramid, for us to conjure up the swarthy forms of the Pharaonic officials who were its last visitors, though forty centuries may have elapsed since their departure."†

But even this falls far within the truth. It is not necessary to have a "new vault" opened; nor are

* Library of Entertaining Knowledge, p. 2.

† Discourse delivered before the New-York Academy of Medicine.

"chemical agents" needed; and we can call up the whole life of the whole people as readily as the faces of "Pharaonic officials." In proof of this, I present the following, given by persons who knew nothing regarding the history of the specimen examined, which was a *shabti* from a Theban tomb in Upper Egypt.

ANCIENT EGYPT; THE SPHINX.

"I see very notchy stones: they look as if water had washed them, and the parts harder than the other had been left.

"I see a stone that looks exactly like a man, only a good deal bigger. It is a statue. I see several others. I see a large peaked rock. I see two men who have been digging: they have a shovel and other things.

"A woman's head! — why! and a lion's body!" ("Why do you think it a woman's head?") "She has ear-rings. The lion's body is very large: part of it is in the ground. There are two men on the woman's head. They have ladders to get up; but they had to splice them with ropes.

"The lion stands on a flat rock cut out square; but it is underground now. It is the largest statue I ever saw. A wagon-load of hay could stand on that head" (1).

By conversing with him, I found that the "peaked rock" of which he spoke was a Pyramid. I gave him the name.

Three days afterward, he tried the same specimen.

"I see large clouds of dust: if higher, they would look like other clouds, only darker. They go very high for dust to go; and the dust falls very thick. The wind

drives it into hills and mountains, and, in places, sweeps out valleys (2). I see those Pyramids that I saw last night.

"There is a river near here. The men who built the head could catch fish. They put some flesh into a box, and that tempts the fish to go in. It is a large box. There are large fish, and many of them. They catch several at a time. The fish are so greedy, they rush to get the bait. The box is fastened to the shore. The river overflows sometimes; and the boxes that are left are swept away. It overflows when it does not rain (3). I cannot see what makes it. When it overflows, there are large pools. The water is swift, and whirls out deep holes." ("See what makes the river rise.")

"I see a very large lake: the water comes from that. There is a smaller river beyond the lake. There are streams running off from mountains (4). It is a very long river, and wide too. I see a very large spring in one place, that gets stopped up sometimes. It runs faster sometimes than others. It is clear water."

(1.) It seems remarkable that the Sphinx of Gizeh (for such it appears to have been) should have been presented; since the specimen came from a part of Egypt at a considerable distance from this. The Sphinx symbolizes the monarch as a conqueror; the head of the reigning king being placed upon a lion's body. In the case of a female ruler, the figure has a female head and the body of a lioness. The Sphinx of Gizeh is hewn out of the natural rock, and lies about three hundred feet east of the second Pyramid.

It measures a hundred and seventy-two feet long, and is fifty-six feet high. At one time, nothing but the head, neck, and top of the back, were visible; the rest being sunk in the sand. It was cleared from the accumulated sand in front of it by some European gentlemen, at an expense of about five thousand dollars.

In a geography that I have, and that Sherman had doubtless seen, is a representation of the Sphinx, with three men on the head measuring it with a line, and a ladder resting against it by which they ascended. Most persons, knowing this, might suppose that the representation which he had seen called up the image to his mind; but then the fact would remain unaccounted for that the image was presented in connection with the Egyptian specimen, and at no other time, and in connection with many other scenes as truly Egyptian, that he had no possible means of knowing any thing about. I do not say that his having seen this representation had no effect upon his mind, and gave no coloring to his description: I have thought it quite possible that it did, when he came, by means of the specimen, into psychometric *rapport* with Egypt and its structures.

(2.) Clouds of dust are not uncommon in Egypt. The air, becoming unequally heated by the sun, ascends in columns, which result in eddies, which draw up with them large clouds of dust; and these are borne forward by the wind.

(3.) I questioned Sherman as to the way by which he knew that the river rose when it did not rain; but he was unable to tell. The Nile, in this respect, is the

most remarkable river on the globe; rising every year at Thebes, on an average, thirty-six feet, and twenty-five feet at Cairo; at such times covering the whole valley with water.

(4.) Could the very large lake which he saw be Lake Victoria, discovered by Capt. Speke in 1858, in whose neighborhood there are many streams running from mountains? I am quite sure that he knew nothing of this at the time the examination was made, nor did he know any thing of the locality from which the specimen was obtained. It is evident that he was quite unable to get at the cause of the inundation.

Four days afterward, Sherman examined the specimen again, but was not able to see for more than a few minutes.

"I see a fire near the desert, or pretty near to it: it is in a kind of furnace-place. It is long ago. They have some stuff melting in this furnace. It is green. I see twenty or thirty men moving about. They are at work, but do not seem to work hard. They are not black, but brownish, — something like mulattoes.

"I see large pieces of that green stuff, with little holes in it, that look like the holes in cinders."

I give some of these examinations more to show how Sherman's development as a psychometer proceeded than on account of their intrinsic value. When he was a baby less than a year old, and lying in his mother's arms, he would see her examining specimens, and hold out his hand for a specimen, and then apply it to his forehead, and shut his eyes. He did this frequently, and seemed to take pleasure in it;

and, as soon as he could speak, I knew that he could see objects psychometrically. For some years, he could see only at certain times; and he was generally able to tell several hours before the time when this would be. There seemed to be no regularity in the time, which was sometimes in the middle of the night. When about fourteen years of age, he lost the power entirely for about six months: but, when it returned, he was able to see psychometrically at any time; though, even now, there are times when objects are presented with much greater distinctness than at others.

ARTISTS OF ANCIENT EGYPT AT WORK.

About two years afterward, I broke off a small fragment, so that the specimen might not be recognized; and he did not even see it.

"I am on a great desert. At a distance I see great pillars and statues, — Egyptian things, such as I have seen in a book.

"Now I am down in a kind of house where there are images of all kinds. You can hardly name any thing that is not here, — birds, beasts, snakes, men, men with birds' heads, and flowers. There are pillars in the shape of great giants, that hold up the roof (1). In the middle of the house is a great head of a man on the floor. The giants' arms are spread out; and they hold each other's hands all round the cellar or house. On their arms, and across their breasts, are black marks that look like crows, snakes, and men and women. I suppose it was their way of writing.

"There are many dark rooms down here underground. Those figures stand in rows, holding it up all

along as far as I can see. On the ceiling are leaves and figures and men, beautifully colored: they look as if they were painted." ("Go back a little, and see them do it.") "I can see them digging those places out of stone; but it does not seem very hard. They cut it with chisels (2).

"Now they are letting a great chest down into this place on a flat board. There are three men on one side, and four on the other. Oh! it is all full of different kinds of colors. It is made of wood, and is full of little shelves and boxes, with hard colors in them like chalks. Some of them are very heavy. There is every kind of color. They are real hard, and sharp at one end. The men talk to one another; but I cannot tell what they say. They raise their voices at the end of what they say. They make a good many motions when they talk. They have a good many kinds of tools there.

"I see one of them using a green color. There is a leaf cut out; and he paints it. He rubs the paint on dry; but I think they rubbed some sticky stuff on before that. He makes the veins of the leaf darker. They are working very hard, tugging and sweating. They do things very slow and sure. The veins in that leaf are so perfect! There must be as many as a hundred in here. They work so patiently!

"Now they are shoving the chest to another great stone. The stones they paint lie on the ground: they are not very thick, but broad and long. It is underground; but they have holes, so that they can see. After the stones are done, they set them up against the side, and drive something in to hold them. There

are figures of all sorts of things on them, — lions' heads, tigers, serpents, and more things than I can tell.

"I see them working at that large head of a man that I saw. The hair is all in ridges: they paint that too. Some of those giants are up."

("See what the place is for.") "As I move the specimen up, I see every thing go up against the side of the place, travelling one after another: what took a week to do I see in an instant (3).

"Now it is all done; and there are hundreds of people: everybody seems to be there.

"They have built a great castle on the outside on top of this cellar; but it is flat on top (4). There are four high stories above the cellar. Those holes they left are built round with stone, away up, higher than the castle. They go right through it: they are for air. In every one of those stories of the castle is a man, with a long painted stick in his hand, sitting in a beautiful chair all carved and painted and gilded. It looks splendid (5). They are all the same. On the tops of those high ventilators are flat rocks: the air goes under them at the sides. On each of those rocks is a statue of a man on a horse; or it is three men on three horses: but there is really only one man with three faces, and one horse with three heads, and three legs for every one.

"There are statues fixed to the wall all round this castle building. There is only one place where they go in; and there is an enormous giant standing there, as tall as this house, cut out of stone: it has a lion's head, and a man's body, and is painted. What large teeth it has!

"Every one that comes in has a little green figure of a man in his hand. It is very smooth: it looks as if it was made of crockery (6). The rooms are crowded full. Just as they go in, they kneel, and talk to these little gods in their hands. They shake them, they tremble so.

"After they have said a long string of stuff, they go in, and walk up stone steps all covered with figures cut in them. When they come to one of those men sitting in chairs, they kneel to him; and then go to the rest, and kneel to them. They go a long way up-stairs to the top of this castle. On the outside of the castle there are not many pictures, but a great deal of their kind of writing in large letters.

"When the people get up to the top, they kneel to their little gods again, and then go down by another flight of stairs. Oh, how they do crowd! One man is at the very top: if he should fall, he would be crushed flat. I can see lakes and pretty castles away off.

"As the people go out, they kneel to those men the same as before. It makes me dizzy to look out of the open places at the side, it is so high. They go down into that place under-ground where the man's head is, and kneel to that.

"What curious figures they make! — animals with men's heads, and men with animals' heads." (Pause.)

"I see nothing now. The old castle is gone. I saw it fall. All is gone but the cellar part. The rocks fell into the sand, and some into the cellar. If they were to dig there, they would find lots of things."

(1.) That colossal figures were used by the ancient

Egyptians to support the roofs of some of their strucures is well known. Wilkinson, in his "Ancient Egyptians," says, "Psammetichus built a magnificent edifice for Apis at Memphis. The walls were richly decorated with sculpture; and its roof was supported by colossal figures twelve cubits in height, which served the purpose of columns." Whether any such have been found in Thebes, I do not know.

(2.) The Theban tombs were excavated in solid limestone; so that Sherman's statement, that the chambers were dug out of rock, and that it did not seem very hard, agrees exactly with the facts.

(3.) Sherman accidentally discovered in the course of his examinations, that, by moving a specimen higher on his forehead, the objects presented were more recent; and, by moving it lower, they were more ancient: so that he could travel in time very readily by merely shifting the place of the specimen on his forehead. It is to this that he here refers; and by this he was able to see in an instant what took years, or even thousands of years, for its accomplishment.

Subsequently this rendered it difficult to obtain tests from specimens, as he wished to know what time was required when a specimen was handed to him; and then he would place it on that part of his forehead which experience had taught him corresponded with the time required. Close to the eyebrows would give him the earth in its fiery fluid condition, back of which he appeared unable to go; while near the hair above the forehead he could see objects near the present time. Many references to this occur in his examinations.

(4.) It appears to have been common for the ancient Egyptians to erect structures above their tombs.

Wilkinson says, "From this and similar paintings, we learn, that, besides the excavated chambers hewn in the rock, a small building, crowned by a roof of conical or pyramidical form, stood before the entrance. It is probable that many, if not all, the pits in the plain below the hills, were once covered with buildings of this kind, which, from their perishable materials (crude brick), have been destroyed after a lapse of so many ages. Indeed, we find the remains of some of them, and occasionally even of their vaulted chambers, with the painted stucco on the walls."

(5.) I showed him representations of chairs in Wilkinson's "Ancient Egyptians," taken from paintings in the tombs of the kings at Thebes; and he said they were exactly like those he saw. These had evidently been copied from carved, painted, and probably gilded chairs of most elegant designs. Gilding was practised in Egypt at as early a period as the age of the oldest monuments.

(6.) This was a *shabti* such as he was examining.

The *shabti*, wrapped in paper, so that it could not be recognized, was subsequently examined by Mrs. Denton: —

"I obtain the influence of a peculiar people: they are enthusiastic, busy. It is in a warmer climate than this. I see a great concourse of people, some riding, some walking. I should think they were going to a kind of celebration, or great gathering. Their minds are fully occupied. Some are on camels. I see many

of them with the crowd. I am not sure whether there are elephants; but I think so. They are a busy race. They remind me more of Egyptians than any other people that I know of; their habits of doing things in company is so like them. They have a similar disposition to go in droves about every thing. I see one thing about them, however, that I never saw among the Egyptians, — the utter unconcern with which they would dispose of any one that did not suit them. When one breaks out from the rest, all consent, and dispose of him as if he were no more than a dog; or, if one was idle, it was the same thing. All would agree in it. They were not a warlike people; or I do not obtain that feeling here. I cannot do justice to them in that respect. They are remarkably unanimous in every thing. They seem to act as bees do toward drones, without any feeling or backwardness whatever. They are not as deliberate as many people. They have some guide or law; and they obey without a question."

After the examination, she said, "I did not dream it was any thing but rock. I went to Egypt first thing, before I said a word; and I could not get away from it. I was sure I was deceived."

EGYPTIAN LIFE AND DEATH THREE THOUSAND YEARS AGO.

A few months afterward, I gave the same fragment to Mrs. Cridge, who knew nothing regarding it. She said instantly, "This takes me to a curious place under-ground: it is artificial. There are dead bodies. It looks like a catacomb. They must have been embalmed; for I can see their faces. They lie on both

sides. I go through the middle. It is dark: there are lights burning. I see an arch. When I get there, passages turn in different directions; so that I feel as if I might lose myself. Some bodies are laid down: others seem to be standing. How strongly I feel their magnetisms!

"It seems like a city under-ground, it is so large (1). It extends a long way. I turn to the right, and go on. At the end is a door, which seems to open into a little room or chapel. There are people buried even in here, and piled one above another in niches that appear to have been cut out for them. I cannot see very distinctly in this room; but there is something in the centre raised above the floor. There is water in it: it is indistinct, however. These bodies are all embalmed. I am going to look at some of them. I am close to one: he lies near the walk. He was tall. There is something around his head. He looks almost like a piece of stone. I can psychometrize him. He was considered a very wise man. He must have been a priest, I think. Yes, he was considered a very wise and a very good man: he was a saint. I don't like it down here. I must get out.

"Oh, what a pretty country! What a pleasant climate! so genial! I see a beautiful valley away off toward the north. I see it a long way, till it is lost in the ranges of hills in the distance. The whole has a hazy look. I see camels, and fine vineyards with grapes: they are ripe.

"I just get the outline of a city. There are gates in and out. As I go in on the right-hand side, I see the ground rises. It is green; and there is but a building here and there.

"I see women in the city, carrying burdens on their heads that look like buckets, but are longer. They wear but little clothing; have short dresses, that are made of coarse, dark-colored material."

Second examination, made six hours afterward: —

"That is not a city now: it seems to be buried (2). I do not want to see that: I want to see the city as it was. One might think it was buried by ashes from a volcano. I do not know what to make of it. It is buried up.

"Where I go in, there is a gate. It is apparently an iron one, with stone round it. Over it there is a beautiful piece of sculpture. How fine it looks! The road is finely gravelled, and adorned with trees. Now I see those women again. They are carrying water on their heads. They are rather fine-looking women; dark hair and dark eyes. They have sandals on their feet. Their complexions are rather dark.

"Now I come to a house: it is made of stone. The windows are semicircles, and have small pieces of glass in them; some of it colored glass. I stand under a porch, or portico, at the entrance. There is no other house near. There is a great variety of trees growing round, such as belong to a warm climate. This portico is of stone, and all covered with figures: it is elaborately done. I see lions, and a figure of a woman, with long flowing robes, kneeling down. Every thing is ornamented. Now I go in. To the right there is a hall, and another to the left. The walls of these halls are adorned all over with the most exquisite workmanship: it is like carving. At the end of both these halls are doors leading to beau-

tiful grounds. I take the right-hand hall, and turn to the right into a very handsome room. The doors open in the middle, much as folding-doors do. There are two doors, both leading into that room; and they are as large as ordinary folding-doors, with a small space between them. There are fine pictures here, and sculpture, and tables in the centre with most exquisite articles on them. But what tables! The legs are carved in the form of lilies and leaves and flowers. Some of them are inlaid with pearl, or what looks like it, and articles of a variety of colors. I see gold and other metals, silver. I see a pitcher, and a large china-bowl inlaid with gold. There is water in it. There are doors that open at the other end into a conservatory, with a fountain in the centre. How it adds to the room! There are mirrors reaching up to the ceiling in the hall where I entered. They make the room look very large.

"There are very fine grounds around that house. It stands alone. It is in the suburbs (3). The city is in a valley, but creeps up the hills a little on both sides. The valley is very beautiful. To the south the country rises very gradually upward and away. I see some persons that look like Jews, with their long beards. They seem to be in business there. I see so much, it would take a month to tell. The men are fond of colors, from their dresses. They are loose; nothing like what men wear now. I see peasants and poor people in the street. Ah! the poor are very poor. They have but few wants; and it is well. I see some of their houses. There is little in them. There are seats cushioned. They take their ease. They seem quiet.

"The gate I went in at was a gate to the grounds. The city has no wall round it. It is not as large as Boston. There is a river that goes through the city in the lower part. It seems different now, as if it was filled up."

In answer to questions after the examination, she said, "A great many houses were separate from the rest, and had large grounds around them. There was not that regularity about the streets that there is about ours. One street was very narrow. The one that I was in led down to the river."

(1.) The Egyptian tombs were sometimes of great extent, and were frequently decorated in the most sumptuous manner. Oblations of various kinds were offered to the dead; and Wilkinson says, "It is probable that lamps were kept burning in the tomb while these ceremonies were performing, or as long as it was open, as in the Roman sepulchres, — a duty which fell to the charge of the keeper or servant of the tomb."

(2.) The filling-up of the city of Thebes, which it no doubt was, has been effected by the mud left by the Nile at its annual inundations. In a century, according to some observers, this amounts to five inches; and, in three thousand years, it would be between twelve and thirteen feet. In some places, where the sand has blown in from the neighboring desert, the accumulation has been much greater than that.

(3.) The house described was probably a villa; and its description agrees remarkably with some of the plans of residences that have been discovered in the tombs. It was quite common for the Egyptians to plant trees about their town-houses.

To some it would appear scarcely credible that any room could have possessed such rich and elaborate furniture, and such vessels and ornaments, as she describes; but, at a very early period, the Egyptians had vessels of "gold, silver, glass, porcelain, alabaster, bronze, and earthenware." "It is certain that basins were kept for the purpose of washing the hands and feet of the guests; and that, in the houses of the rich, they were of gold." * Glass-blowing they were acquainted with at least thirty-five hundred years ago, and even made imitations of precious stones equal to any of the productions of modern art.

EGYPTIAN FESTIVAL.

To render it impossible for any knowledge of the specimen to affect the result, as well as to try an interesting experiment, I some time afterward reduced a part of the *shabti* to impalpable powder in a carefully-cleaned iron mortar. Sherman dipped his finger in this, and rubbed it on his forehead, still knowing nothing of its history.

"I see sights of things, — Egyptian things. There are several little pyramids made of shells: they are just a little flat on top, where there is something like a flag. There are stripes of blue and yellow on it, and red crosses, and pictures half bird and half dog. There is one pyramid with figures on it made by shells sticking out farther than the rest, — men with birds' heads and snakes' heads and animals. Then there is something like writing above.

* Wilkinson's Ancient Egyptians.

"The people are marching, marching round. I never did see such a handsome place! They are marching into a large place like a pyramid. When it is shut, you would hardly know there was any entrance.

"There is a path to the large pyramid; and these shell pyramids are on each side of the path. The path is made of wood, but is glossed over so that it looks like glass. The people wear slippers: some have beads on, and look very beautiful. They all walk softly. The women wear a dress that does not come quite down to the knees, and drawers below that. The dresses stand out like a bell all round. They are painted or colored, and look glossy (1).

"There are palm-trees near the large pyramid, that are planted very thick and orderly; and the people go there and sit under them. There is a pond near, and beautiful little canoes on it. It is all fenced round; and there are gates to it. The sides of the pyramid are covered with large figures cut and painted.

"I see pyramids with paths to them, and shelly pyramids on both sides as far as I can see. The shell pyramids are covered all over with something glossy, so that they are quite smooth, — as smooth as a plate of glass on the outside, — and transparent.

"They are holding a festival. I should like to draw some of the things they have for plates. They are flat and square; no edge turned up as our plates have. They have what look like fish-scales all over them, and are half an inch thick. They eat with what look like sticks: they are pointed, but are not made of wood. They stick them into their food. They have their drink in cups that are beautifully gilt inside and out. I never saw so many people in my life.

"They make great use of glass. They have some kind of light that is not hot. It seems like a phosphorous light.

"They take great care of grass, and love plants dearly. They have them in their houses, all around out of doors, and in their pyramids. They have live flowers all over their heads. They almost seem to worship flowers (2). They sing; but it is curious music.

"I see large statues for pillars; some bent over, and holding up the upper part of a building. Black figures are cut into them.

"I see a plant so clear, that I can smell, taste, chew, and feel it, so that I cannot tell any difference between that and things I see every day.

"The clothes of these people look as if they had gold threads sewn in them. They carry frames to keep off the sun: they are very soft, and have blue tassels (3). The people all go one way, and take time easy, — very easy. They have every thing very clean.

"As quick as a flash that went; and I see a rocky place. Deer are feeding in a valley; and a mountain away off looks blue. It is very steep. The day is very hot. I can see the heated air rising from the ground. It does not seem as if man had been here. I hear birds singing. The deer seem very tame. They seem as if they saw me. It is a very nice place. There is a river in the valley. It must be in the human period. I see a savage's weapon on the ground, — a rude club, — with blood at one end" (4).

(1.) "The colored dresses represented in the Egyptian paintings, worn by women of rank and by the

deities, much resemble our modern chintzes in the style of their patterns; though it is probable that they were generally of linen, instead of calico. Some were probably worked with the needle, and others woven with *gold threads*." *

(2.) The love of flowers was characteristic of the Egyptians; and, "at parties, the head-dress of every guest was bound with a chaplet of flowers." †

(3.) "Sometimes their attendants carried a sort of parasol to shade them from the sun, which, in the present instance, appears to have been of leather, stretched over a light frame." † In the light of this fact, the name of "frame" that he gave to the parasol seems very appropriate.

(4.) This last vision came, probably, from the clay of which the *shabti* was originally made; the older influences still abiding with the specimen, and giving us a glimpse of Egypt before even the age of stone began.

About a year afterward, I tried him again with the same powdered *shabti*, of the character of which he still knew nothing: he had tried many specimens in the mean time.

ANCIENT EGYPTIANS CATCHING WILD-GEESE.

"I see a boy trying to jump on a horse. It is a desert, — all sand, sand: I can see nothing else. He is on now. The horse is thirsty. On each side are buckets fastened with rope, and he gives it some drink from one.

* Wilkinson's Ancient Egyptians. † Ibid.

"Now I see an altogether different place. It is in the human period; for I see a thick round hedge, and an opening, and a net over all but the opening. It is to catch geese. There is food in it; and the geese squeeze in to get it, when the people catch them. I see as many as a hundred at once. The hats of the people are like Mexican hats, — broad-brimmed. It is hot there, and they keep the sun off. They walk in, and pull them out by the legs.

"They take them off to a low house strongly built of great logs. They put them in a kind of pen made of bushes woven together.

"They have got all out but a big one that does not seem to care for them. One fellow has seized him now. They scatter corn in again all nicely, and fix the net for another lot.

"These geese come down early in the morning. I see them next morning coming one by one, and pushing through the hole. What a *sqwawking* they make when they cannot get out! The sticks around the hole prevent them. They push their heads between the sticks, but cannot get back. There are two big ones in now. It is nearly level here, and clayey in the lower places.

"Now the men are coming, creeping behind the bushes, and enjoying it. They run to it now. The geese fly up to the net, and are very angry: they bite the net in trying to get out.

"The people live on these birds and their eggs: they get eggs out of that place. The eggs are not white, but grained eggs, speckled with brown and white."

THE MUMMY-MAKERS AT WORK.

I gave to Sherman, about three years ago, a fragment of the skull of a mummy from Egypt, and requested him to tell me whatever presented itself; he knowing nothing of the nature of the specimen.

"I see a river and a very large fish. It seizes a bird by the legs, and pulls it into the water." ("Get the human influence.")

"I see a man going down a hill. He has a stick in his hand, that seems to have been cut for a weapon.

"I see adobe houses down by a river; and the grass or rushes are very high. There is a fire out of doors in one place. The people are roasting a large flat fish. It would make you laugh to see them. They hop round, and grab the fish before it is done. They are hairy, and have long hair on the head, especially the women. Their complexion is brown; and their faces are all figured up. There is a blue line across the top of the nose, and curved lines on the cheeks and on each side of the nose. A little way off, they look as if they had spectacles on (1). Such great lips as they have! Their arms are strong. Some are large, and others slim."

This seemed to belong to a much older time than the mummy could possibly have done; and I said, "Come nearer to the present time."

"These people pitch their dead into the river. I see them keep throwing them in."

("Go down the river.") "I've come to a great waterfall now. There are a great many birds here,

something like a swallow, and kingfishers. The country is beautiful down there. There are great high trees, — tremendously high.

"I see a great splendid tower built on the bank of this river, and an arched bridge across the river. It is very fine. It is for people to walk across, and bends as if it was made of India-rubber, it swings so. The bridge goes from that great tower. By jumping on it, it would toss you two feet. The people are finely dressed that cross it: they make great use of silk. There are great trees like palms: the people walk under them, and sit in the shade. It seems hot here, and they have fans. Farther down I see cliffs.

"I see some houses; but they are not very nice. They surround this big house. I see gates, and paintings on the posts and gates something like Egyptian paintings. Some of them represent scenery, waterfalls.

"There is one person with about twenty little white dogs all fastened by strings. This man hands one of the dogs out to another; and the other pulls out a shell from a kind of pocket, and gives to him. It must be a kind of money. I cannot understand what they say. There are men round this tower cutting grass with shears. They cut it very near the ground. I see a place where there are a great many things of different kinds, I think, for sale.

"Oh! I see the fattest man I ever did see. He sits on a kind of three-legged chair: the legs stretch away out. I see a lady wearing one of those shells, red on one side, and black on the other. It is attached by a silk cord through a hole."

("See what they do with their dead.") "They put them in great dark rooms in this large building that I saw. There are a great many white cloths over them. They seem made of flax. When the men come up, they are covered with spider-webs. It is so dark in here, you cannot see your hand before your face. The door is so fixed, that they shove it up by handles as we push up our windows. The bodies are wrapped and wrapped in cloths a great many times. They wind them up so that they look a great deal larger. They tie them with ropes, and pull hard. That is done where it is rather dark. There is a pack of cloths as big as this room. They look like tablecloths; but they are pretty coarse. They have gloomy lights in there; and the smell is horrible, as strong as if it was full of pepper. The men have a cloth over the nose and part of the mouth (2). They have come out now; and a man is handing them shells, — dropping them into their hands. He gives each one six; and now they go out of the gates. One of the men has gone to that store that I saw, where there are things in the window. There is no glass in it, but something like mica: if it is, it is very thin. He has got a little bagful of black things, — hard lumps. He seems to relish them much. They are white inside. He gave one of those shells for it (3). It tastes like ground-up cocoanut. There are as many as fifty in this bag. It takes a good while to eat up one.

"This man is going to one of those houses. There are stone steps to it. The house is ornamented, and the steps too. There is a little boy hugging him as Willy does you. He gives him one of those things,

and a bigger one five. I think there is sugar put with it. It is something like chocolate-drops, only hard. I do not see very well."

(1.) The first part of the examination seems to refer to Upper Egypt; and savages as low as those represented by him may have existed there even in the time of the Pharaohs. Adobes, or unburned bricks, were very extensively used in rearing structures in Egypt.

It may seem strange to some that tattooing should ever have been practised in Egypt; but the probabilities are very much in its favor. In Lev. xxix. 28, we read a commandment given to the Hebrews: "Ye shall not make any cuttings in your flesh for the dead, nor print any marks upon you." And it is evident that this must have been a practice among some people in their vicinity at that time. The Bedouin Arabs, and especially the females, practise tattooing to this day.

(2.) The process of embalming the wealthy Egyptians is thus described by Herodotus: "There are men who professedly exercise this art. . . . First, with a curved iron, they extract the brain through the nostrils, partly by pulling it out, and partly by pouring drugs in. Then, with a sharp Ethiopian stone, they cut the body in the flank; and through this aperture they take out all the viscera, which they wash with palm-wine, and clean with powdered aromatics. They then fill the belly with the purest powdered myrrh and cassia and other perfumes, and sew up the wound. In the next place they cover the body with natron, and bury it in the same material for seventy days.

When the seventy days are passed, they wash the body, and envelop it in bandages of fine linen covered with gum." He says the body is then returned to the relatives. In cities there must have been establishments where this business was conducted on a large scale.

(3.) That shells were ever used as money in Egypt, I have no knowledge. They are, however, used in some parts of Africa to-day.

The Egyptian may die; his body be embalmed, and lie in darkness for thousands of years; it may then be exhumed, part be burned to make coffee for a wandering Bedouin, and part be carried to a distant land by some curiosity-hunting traveller: but the Egyptian still exists in some unseen realm, and can be found by the sensitive who possesses a fragment of his body.

HORACE SMITH ADDRESSES THE MUMMY.

"And thou hast walked about (how strange a story!)
In Thebes's streets three thousand years ago,
When the Memnonium was in all its glory,
And time had not begun to overthrow
Those temples, palaces, and piles stupendous,
Of which the very ruins are tremendous.

Speak! for thou long enough hast acted dummy:
Thou hast a tongue; come, let us hear its tune.
Thou'rt standing on thy legs, above ground, mummy,
Revisiting the glimpses of the moon;
Not like thin ghosts or disembodied creatures,
But with thy bones and flesh and limbs and features.

If the tomb's secrets may not be confessed,
The nature of thy private life unfold.
A heart has throbbed beneath that leathern breast,
And tears adown thy dusty cheek have rolled.
Have children climbed those knees, and kissed that face?
What was thy name and station, age and race?"

But the mummy was never dumb: we were deaf; and, now that our ears are opened, he tells us most eloquently all that relates to himself and his race; and we find that the most trivial actions of his life are more abiding than the stars.

But all the visions seen by the psychometer are not as intimately connected with the specimen as those already given. Sometimes it is impossible to trace the slightest connection between them; and sometimes, as in the following, what is seen may be correct, but it is difficult to account for. It was seen with the same specimen.

DAILY LIFE OF THE POOR IN ANCIENT EGYPT.

"I am in a house, and see a rat in a trap. It is different from our traps. There is a weight that drops down when the string is gnawed. What is on the string looks like mashed-up wheat. It is in the back part of a shanty, with things made out of clay, like old tea-pots, with faces on them, and old clay-pipes without glazing, and things for cooking. There is a wheel too, and an animal walking round and round inside. They churn in a clay thing: it is not clean. Some comes off, and gives it a dirty color. There is an old lazy woman sitting in a chair that looks like a four-legged saw-horse; and, when the animal does not go fast enough, she hits the wheel with a cudgel, and that scares it, and makes it go faster. The animal looks like a young goat. The butter is hard, but dirty. They relish it, if it is dirty. The animal is out now, eating grass.

"They have something like potatoes, long and yellow; and they mash them with stones in a wooden trough. The old woman sometimes hits her finger, and she gets angry. She seems in a bad humor to-day: things don't go right.

"There are only two rooms, — one where they eat, and the back place where the rat was. There are cobwebs hanging down everywhere. The house is made of logs. At one end of the eating-room they have a large place filled with clay; and they have made a fire in it till it is hard. There is a hole on each side in the floor: sticks are driven in; and there is a cross-piece to hang things on to cook.

"They eat what you do, — Graham bread; only it is very brown. I don't believe they can get the other. They have a table made of sticks, woven and fastened to four sticks driven into the floor. They have dishes made of clay; but the clay was not good: it had a good deal of sand in it. They have wooden spoons as large as one's hand; and I hear them grate against the sand as they use them. The youngest boy is about twelve. He spilled some soup on the table; and the old woman hit him on the side of the head with all her might. The father does not care what they do. He is lazy.

"The chairs are very rough. The bed is made the same way as the table, and has straw on it. The house looks like a barn. The only pillow is a little hay, that rises higher. They all sleep in the same bed. They must be strong to weave those sticks as they have done; for they are very tough. (The old woman does her share of bossing.)

"The man makes these chairs and beds. The boys

bring sticks. He takes strong ones, and fixes them in holes in the side of the room; and then bends limber ones over, in and out, and cuts off the ends. For a bed, he puts a post in the floor at the corner, and fixes the sides to that: the other sides are fixed to the sides of the room."

CROCODILES OF ANCIENT EGYPT.

I have a piece of calc-spar brought from the crocodile pit at Maabdeh, Egypt. This I gave to Sherman for examination about five years ago, he knowing nothing regarding it.

"I see a camel. It is drinking. Two men are by it. It drinks a long time. It has a pack on its back. It is food for the men, I think. It is very tall. I see a camel in a shower of sand. He kneels down; and two men are covering their heads up to keep the sand out of their mouths. I see a great many camels on the desert. The sand, which is very fine, is rolling up in clouds. It is very hot.

"I see a long, lonesome road. Many camels are far ahead, travelling on it. The road is very crooked, winding about among hills of sand. Those camels in the distance look very small.

"I see brown rock sticking out of the sand, with holes through it; and a very large one underneath, covered up by sand. There are marks on it, as if it had been in a building once, and figures of men and animals, — pictures of various kinds. It is very old, and worn some. It is flat, and has figures on both sides; but they are better on one side than the other. I see a picture of people rowing in a pretty boat.

"I am on one side of a hill of sand, and the road is on the other side. Sand is everywhere, like the waves of the ocean. The next wind makes hollows where the hills are, and hills where the hollows are. I see a river away off at a great distance.

"I see a very curious-looking animal by the water. It has large eyes, a long leathery tail, and four feet. It is an alligator (1). I never saw such a thing in all my life before. I see a young one; but I should run from it if I was there in the body. It looks right at me as if it saw me. It does see me, and runs after me." ("Do you run?") "I do so." ("Stand still.") "I dare not. A bullet would not go through it. It is two rods from the water. I see a heap of sand like a cock of hay. It looks as if it made it. Oh! there are some very large white eggs in it. I can feel the things wriggle inside of them. There are seven of them.

"What big steps it took! Now I see one on the other side, in the water. They have long, sharp, pointed teeth, larger toward the bottom. I wish I could carry an egg home! It stays close by them.

"Both the crocodiles are in the water now. They seem lazy, and as if they would not touch any one. They have plenty of fish there, and large ones. The water is very deep. I see one big fish jump out and in again.

"Sometimes I see as clearly as when I am looking with my eyes, and at other times it is misty. At first, where I saw to-night, things were upside-down. I turned them over by turning the specimen over. I can see all round, and every way, by turning the specimen right (2).

"The eggs are long and white, and have purple specks on them" (3).

(1.) It was, of course, a crocodile, as he subsequently calls it.

(2.) He found that he could move the position of objects by moving the specimen; but this, although sometimes the case, is by no means common. The psychometer seems to depend upon the specimen most at the commencement of the experiment; and, as the examination proceeds, he becomes, in a great measure, independent of it.

(3.) I have not been able to learn whether there are purple specks on the eggs of the Egyptian crocodile.

THE EGYPTIAN PYRAMIDS.

In 1870 I tried Sherman with a specimen of fossil wood, obtained in the vicinity of Cairo, Egypt, thinking that it might give a picture of Egypt during the tertiary times. What was presented was, however, much more modern.

"I see two ostriches. What strides they take! They are going at a good rate, though they are only walking. One has come to a small patch of grass, and is nibbling it off fast. Such scaly feet as they have, and large! What feet! There is one with twelve or thirteen young ones with her (1). One just hatched out of an egg runs to her. I can see the broken egg. The lower part is broken off; and it looks as if it was half buried in the sand. Now they have come to quite a patch of grass, and they are picking it. It" (he means the country) "is not all covered with fine sand like that you have in the bottle" (referring to a speci-

men of sand from the Libyan Desert). "I see lots of their tracks in the sand. The old ones pick grass, and feed some of the youngest: the others pick for themselves. When they run, they flap their wings back to make them go.

"I see three or four Pyramids in a row. One of them is so far off, it seems as if half of it was underground. They look nice. I am close to one; but I see no people, and no signs of any, but just the Pyramids. It is very nearly solid (2). There is just a small room inside. I see two ropes in it, hanging down. They look as if they were made of sinews. There is thick cloth on the bottom.

"I have gone into another. There is a deep hole in the middle of this, and there is a room as large as this house. I see nothing in it but wooden seats. Down the hole is a sort of a ladder; and, when you get down, a round passage, that goes along to another Pyramid, that has a large room in it,—larger than the other a good deal. There is a thing comes down made of something white, that branches out, and has little statues on where it branches. I see where there have been windows and a door: they are blocked up now. There are not Pyramids on every desert, are there? This must be Egypt.

"I see a square tower now; but the stones it is made of are small. I can see a town now, and steeples near water (3). I am in the town now. They are mean-looking people. They don't look like Egyptians such as I have seen. They are smoking pipes that look like a rope, with a vase on the end, that stands up away off. They look lazy. A good many

are in tents, taking it easy. I see the path where they go across the desert. I see camel and horse tracks. It is well trod."

(1.) Vaillant, the African traveller, disturbed an ostrich from her nest, in which were thirty-eight eggs; but each female ostrich is supposed to lay about ten eggs.

(2.) I suppose the Pyramids seen by him must have been the Pyramids of Gizeh, opposite Cairo. His description differs in some respects, however, from what we know of them. There are three principal Pyramids, which are, as he represents, nearly solid. There are two rooms in the largest Pyramid, — the king's chamber, thirty four-feet long, seventeen wide, and nineteen high; and the queen's chamber, seventeen feet long, fourteen wide, and twelve high. Belzoni discovered in the second Pyramid two chambers, the larger one forty-six feet long, sixteen feet wide, and twenty-three feet high, in which was found a granite sarcophagus. I think a specimen from the Pyramid itself would have enabled him to give a fuller and more accurate description.

(3.) This was probably Cairo; but whether at the present time, or some past time, it is impossible to say.

COMPARATIVE AGES OF GEOLOGICAL AND OTHER SPECIMENS.

When examining ancient specimens, I found that the psychometer obtained the impression of travelling backward until he came to that time with which the specimen was most intimately concerned, — if a coin, to the

time when it was struck; if a bone, to the time when it formed part of a living animal; if a sedimentary rock, to the time when it was deposited; or trap formed from melted sedimentary rocks, then to the time when they were melted and it poured out. This was the case with Sherman at an early period; but subsequently it became more and more difficult for him to stop at that period, or to mark it. All particles of matter belonging to our planet, being as old as the planet, can carry the psychometer back to its fiery beginning; and only careful observers note the precise period of those very marked changes that have taken place in their history. I found by experiment that Mrs. Denton could take two specimens, and in all cases determine their relative age; and she could do this with coins when the difference was only a few years. I present to the reader a few out of a great many experiments tried for the purpose of testing this. In all cases the specimen was unknown to the psychometer (unless otherwise stated), and generally unseen by her.

DEVONIAN BONE, EOCENE LIGNITE, AND GLACIAL CLAY.

"I go farthest back in time with this (Tully limestone). I do not go as far back with this (bone from glacial clay). I stop considerably on this side of the period of this (lignite). It is not as far on this side of that (lignite) as that (the bone from Tully limestone) was on the other side."

Any geologist knows that the Tully limestone is older than the eocene tertiary, and that from the glacial period to the eocene tertiary is a shorter

period than from the eocene tertiary to the time of the Tully limestone. But how came the psychometer to know this by merely placing these specimens upon the forehead for a few moments? Mrs. Denton says that going back in time produces the sensation of travelling; and she thus marches into the past till she finds a stopping-place, the distance travelled over giving the measure of time; so that, to the psychometer, time is apparently transformed into space.

TWO NICKEL CENTS OF 1869 AND 1872.

"This," handing me the one of 1869, "is slightly older."

RUPEE OF 1840, AND SPANISH QUARTER OF 1808.

"I do not go as far back with this," handing me the rupee, "as I do with the other."

BONE AND STONE HATCHET.

Bone of stone age (**1**), referred to in first volume of "Soul of Things," p. 205, compared with stone hatchet from Lake Neufchâtel (**2**).

"What a difference between the artificial age of this (**2**) and the real age! I thought that it was bone; but I learn from this that it is not. It is very difficult to get the comparative age of these, owing to the three ages that come up and confuse me. I go back with these for a long way, — like going along two parallel lines. I have always before taken, first one, then the other. This (**1**) is older than that (**2**)."

I have no doubt that her judgment was correct, the bone belonging to an earlier and ruder period.

FLINT AND FOSSIL LEAF.

Flint from the chalk of England (**1**), and fossil leaf from carboniferous formation, Grundy County, Ill. (**2**).

"This (**2**) goes a great deal farther back than the other, — one-quarter farther back."

I think it is not unreasonable to consider the time from about the close of the carboniferous (the age of the leaf) to the cretaceous as about one-fourth of the time from the cretaceous to the present; though some geologists would consider the former much longer. Of course, the psychometer's calculation in this case was nothing but a rough guess.

POST-PLIOCENE SHELLS AND ROMAN BRICK.

Shell (**1**) from post-pliocene beds, Charleston, S.C.; shell (**2**) from a deposit near Salmon River, Nova Scotia; and brick (**3**) from ancient Rome.

"This (**3**) belongs to the historical age. I cannot go beyond historical times with it. The shell (**1**) is older.

"This (**2**) is more recent than the other (**1**). They seem to me to belong to the same geological period." I then informed her what the specimens were; when she remarked, "It cannot be less, I think, than a million years from this to the post-pliocene."

The brick from ancient Rome belongs, of course, to the historical age; and the shell from Salmon River, which is post-glacial, is younger than the post-pliocene shell from Charleston; though they may be said to belong to the same great geological period.

BONE FROM TULLY LIMESTONE.

"It seems like Devonian when I get there; though I do not notice the carboniferous. Is that because there is none in the part of the country that it came from?"

The specimen was obtained at Bellona, near Geneva Lake, N.Y. There are no carboniferous beds in that part of the country; but, whether that was the reason that she did not observe it, I am not prepared to say. At all events, its absence did not prevent her from designating the age to which the specimen belonged.

EOCENE LIGNITE AND MIOCENE AND EOCENE BONES.

Lignite (**1**) eocene tertiary, Brandon, Vt. Fossil bone (**2**) miocene tertiary, Bad Lands, Nebraska. Fragment of vertebra of zeuglodon (**3**) eocene tertiary, Alabama.

"With this (**2**) I see a shallow sea, covering thousands of square miles, — so shallow, that in many places I can see the bottom. The water is less salt than the ocean.

"I see a large flock of large swimming-birds sailing on the water. I think they are larger than geese, though they resemble them.

"I have several times seen a largish animal near the shore; but it is at a distance, so that I cannot see it distinctly. It seems to have a dark-colored, thick skin; and I think it is a mammal.

"I seem to go farther back with this (**1**) than with the other. It gives me dry land and the impression of vegetation. I see a hill, or large swell, with many

small trees, hard-wooded, but sappy, — juicy. The leaves are rather smooth, generally long, and have a sweetish, tart taste. I think they might be good for some animals to eat. I rather relish the taste of them. The bark has a bitterish taste. This seems to be the early part of the same period as the other.

"I get an impression of animals that feed upon those leaves. I cannot see them: they seem slender, and have long necks. The trees are low, and the leaves very fragile.

"With this (**3**) I see a long, broad sweep of country, in some places marshy, extending along the sea: on one side there are hills. This specimen is not quite as old as this (**1**), but considerably older than that" (**2**).

There are many remarkable statements in this examination. When this and the preceding were made, I did not know the age of the Brandon deposit, nor that of the zeuglodon beds of Alabama, nor their relative ages when compared with the Bad-Land deposits of Nebraska. The Brandon lignite bed is placed now by our best authorities at the base of the tertiary, or the lower eocene. This makes it (**1**), as she represented it to be, the oldest. The fragment of zeuglodon (**3**) she represents as not quite as old as the lignite, but considerably older than the bone from Nebraska: and, in accordance with this, the zeuglodon beds belong to the middle eocene, the next deposit younger; and the Bad-Land deposits, either to the upper eocene or the lower miocene, which would make them considerably younger.

In connection with the Bad-Land specimen, she sees

a shallow sea covering thousands of square miles. Such a sea or lake, all geologists who have studied the region know, must have existed in that part of the country when the great clay beds were deposited, in which various fossil mammals have been found. The shells indicate that the water was fresh; but since we know that the sea previously existed there, and it gradually changed to fresh water, as the country was elevated, it is very probable that the water at that time was brackish.

With the Brandon specimen she sees hard-wooded trees. Fruits belonging to trees of the same genera as the hickory and the beech, the cinnamon and the horse-chestnut, have been found there. Some variety of the genus *Cinnamomum* may have been the particular tree she examined. What she saw seems to be in perfect harmony with what has been discovered. There must have been animals feeding in the tropical forests of Vermont at that time; though the geologist has not yet found them.

With the zeuglodon specimen she sees the sea; and, of course, this agrees well with the specimen, since the animal of which it formed a part lived in the ocean.

Let any one take three similar specimens under similar circumstances, and guess at their comparative age and original suroundings, and what would the result be?

GRECIAN COIN, THEBAN SHABTI, PAINTING, AND SWISS STONE HATCHET.

"This (the coin) is the youngest: it is one-quarter or one-third the age of the other (the *shabti*)."

Compared the *shabti* with a fresco-painting from Pompeii.

"I see the green waves of the ocean with this (painting), I am so near. I see the white and green together. That (*shabti*) must be as much as four thousand years older than this."

Stone hatchet from Neufchâtel, previously referred to. She probably knew what this was. "This is as much older than that (*shabti*) as that is older than the first I tried (painting)."

According to this estimate, those who framed the stone hatchet existed about ten thousand years ago.

THEBAN SHABTI AND GREEK COIN.

Shabti wrapped in paper, compared with Greek coin of unknown age.

"I should like to know where this (*shabti*) is from. I hardly dare to tell what I see.

"I obtain the influence of a peculiar people: they are enthusiastic and busy. It is a warmer climate than this. (Is this wrong, or right?") ("That is right.")

"I see a great concourse of people, some riding, some walking. I think they are going to some kind of a celebration. Their minds are fully occupied. Some are on camels. I see many of them with the crowd. I am not sure whether there are elephants; but I think so.

"They are a busy race. Are their habits known?" ("Yes.") "They remind me more of Egyptians than any other people that I know of, their habits of doing things in company are so like them. They have a similar disposition to go in droves about every thing.

I see one peculiarity about them, however, that I never noticed among the Egyptians, — the utter unconcern with which they would dispose of any one that did not suit them. When one breaks out from the rest, all consent, and dispose of him as if he were no more than a dog: or, if one was idle, it was the same thing; all would agree in it. They were not a warlike people, or I do not obtain that feeling here. I cannot do justice to them in that respect. They are remarkably unanimous in every thing. They seem to act as bees do toward drones, without any feeling or backwardness whatever. They are not as deliberate as many people. They have some guide or law, and obey without a question. They seem to have a good knowledge of what they are about.

"This (the coin) does not take me as far back; not more, I think, than half as far. The difference between those people is wonderful. It seems, in one sense, like coming from midnight to daylight, the difference in disposition and almost every thing is so great. These people are so much more individualized, each has a character of his own, and a sense of his own importance."

After the examination was over, she said that she did not dream that it (*shabti*) was any thing but rock. "I went to Egypt first thing; and I could not get away from it, though I tried hard before I said a word. I was sure I was deceived."

I feel quite certain, that, in time, the actual ages of specimens can be worked out, and we shall have a reliable chronology. Psychometers trained for the

work will go back year by year (independent examinations showing their correctness), and we shall know the very time when the most interesting events in the history of the planet took place. I merely give the foregoing as rough approximations: though in all cases, as I have stated, where the specimens are tried, the psychometer will designate accurately which is the older; and the value of even this in geology is very great.

ANCIENT SYRIA. — EARLY MAN IN PALESTINE.

The specimen examined by Sherman was the small piece of hornstone from the Mount of Olives, referred to on p. 155 in the first volume of "The Soul of Things."

"I see a river, and beyond it a beautiful mountain. It is high. I see a little snow on the top. There are several peaks. I see no people; but I see signs of them, — their tracks on the side of the river.

"I see one man now going on all-fours, it is so far back (1). He does not go that way all the time. His lips are very thick; and he is dark brown. The country is very beautiful; and the shadow of the mountain in the river is fine. The river is no larger than Charles River.

"Oh! I see the way he gets his living. He creeps down to the river, and feels in the water, and grabs the fish, and eats them alive. I can see the tail moving as he eats one. He does not mind the scales. He can walk straight: he does now when he is eating. He only goes on all-fours when he is catching the fish, I see. He is very cunning. He squeezes them

very hard when he gets hold. The fish seem like pickerel; but they are blue.

"Now he has come to a big black water-snake. He picks up a rock, smashes its head, and marches on, and never looks behind him. He is very sure of his aim (2).

"There are some very nice colored shells by the river. He treads on them sometimes; and the points stick into his feet, and he jumps.

"He is going up toward some woods. He runs up to one of the trees; and, where the bark has been peeled off, he is drinking the sap as it runs out. It is very sweet, — about as sweet as honey. The leaf is narrow, and looks like a pine-leaf.

"There are a great many monkeys and apes in these woods. They are playing, carousing, and imitating what he does. There are some very pretty birds too: some of them have red heads, blue tails, and pink-and-blue wings. They are very handsome: the colors are as beautiful as those of the rainbow.

"The hair around that man's ankles drags on the ground, as he walks, like the feathers of a bantam. When he walks on his hands and feet, he looks almost like a bear; only he has no tail (3).

"He has found a club; and he bites it, and swings it round. I don't know what he bites it for.

"Oh, such a bear as I see! It is a tremendous one. It is bigger than a cow, and a kind of brown color. It is standing on its hind-legs, and trying to climb a tree. There is a bee's nest in the tree; and it is after it. The bees come round, and *biz-z-z:* they are on its face, and it rubs its paw over it to kill them. The

man ran away: he was afraid. The bear has gone up, and is digging into the honey with its paw, and pulls it out, and devours it. The bees are even in its mouth; and it eats many of them. Some get into its ears, and others on its paws. I see a swelling above its eye. There is a hole in the tree where the nest was; and it scrapes the honey out of that. Now it is coming down, and is running off. Now it feels the stings, and is rubbing itself over.

"The man is throwing sticks at the monkeys; and they throw nuts at him; and he cracks them with his teeth, and eats them. He chatters with his teeth every time before he does any thing. There are monkeys in every large tree.

"I saw lots of little young monkeys, with no hair on: the mother-monkeys were snugging them up, and taking great care of them."

(1.) This shows that we should carefully discriminate between what the psychometer sees and the conclusions that he draws from what he sees. What he saw on this occasion was, I have no doubt, correct; but his conclusion, that he was walking in this manner because he could not walk upright, and that this was because what he saw was so far back in time, was altogether wrong, as he subsequently discovered.

(2.) Before bows and arrows were invented, men threw stones, and became very expert. Sherman represents many of the early men as doing this with great precision and force.

(3.) This was probably during the pliocene period, when even the best representatives of the human race were but little above the brute.

ANCIENT EUROPE. — PRIMITIVE RACES OF ITALY.

Sherman has always been attracted to the early history of man: and, even where a specimen appears to have little connection with that history, it is easy for him to obtain it; and, with many specimens, he invariably recurs to the primitive races of the country from which they were obtained.

In August, 1866, I gave him a piece of plaster from Cicero's house, Pompeii, anticipating some description of the ancient city, and possibly of the eruption of Vesuvius, in which it was buried.

"I see a snow-ball fight: about thirty boys are fighting. There is a snow-man; and they are throwing snow-balls at him. It is a pretty cold day; but the sun is out. They are playing in a round open place in a city where four roads meet. It is almost out of the city. The city is large, and the houses are pretty large. There is a river near here.

"I see a mule now, and two donkeys, that are pulling a cart with three boys in it. Those boys throw snow-balls at them; but they are soft, and don't hurt. Now they are throwing snow-balls at a man."

RACE OF GIANTS.

This gave little promise of Pompeii or Vesuvius; and I said, "Go back in time."

"There is no city there now. I see a large, tall man, who has no clothes on: he has hair all over him, just like a bear. He looks exactly like a tall animal walking; but it is a man. He has blue eyes; and his hair is a dirty yellow; but the hair on his body is dark.

He seems to be all alone. The greatest part of his head is behind his ears. His feet have toes like ours; but they look so great! The skin is greasy and scaly: it comes off in little scales. The hair comes down to the eyebrows. His nose is large and curved and peaked. He is sitting now on a large rock. There are wrinkles on his forehead. The hairs on his head are coarse. He is not upright, but bent over; and, when he walks, he looks down upon the ground. He is tired: he has been walking a long way. He eats something long that grows on a tree near: it has a kind of sour taste. He has eaten three of them. There are as many as three hundred on that tree, besides the little ones. The climate seems pretty warm. It is summer there now.

"There are a good many of them on one side of a river; and he is on the other. Why! he knows how to swim: he is a real good swimmer. He likes the water. He tells them what a feast he had. All of them can swim. They are going across to that tree. The first one is very large: I can only reach to the top of his leg (five feet). They are all naked and hairy and tall. I can reach to the breast of one man (1). They pick three or four of those fruits apiece, and then eat them. They are clearing the tree pretty fast. There are fourteen of them. They reach up, and pull them off, but leave the little ones.

"Now I see them eating a bird: they eat it raw. They have nothing to cook it with. They screech so loud! They jerk it to pieces, and eat it all bloody. They hit it with a stick across the back of the neck. They pick its bones clean, and pull the meat off with their fingers.

"The river I saw is the one I saw when the houses were there. It empties into the ocean, I think. It is salt water.

"They bend the trees over, and fasten them, and then spread broad leaves on: these are what they live in. I see seven or eight women: most of them are in one hut. The women are not as large as the men: they are naked too. Now I see some babies. They are pretty large. They have fine hair on their bodies. They don't cry. They have given part of that bird to the women; and they give some to the babies. I see no place for a fire. They sleep on leaves: they are spread on the floor, and a bundle makes a pillow. All the women have gone to one hut, and all the men to another. They seem to sleep sound."

("See what they do in the morning.")

"What a large shell I see! They have eaten the meat out of it, and left it. In the morning they commence laughing and ha-ha-ing and screeching; then they ramble through the woods. As soon as they get near the river, they run and jump in. There are great flies that bite horribly: they plague the men. Their bite makes a bunch like a boil. But they are only near the river.

"Oh, what a flock of those birds I see! The men tear sticks off the trees as they run, and pull up young ones, and hit them back of the head. They scatter and run; but they have killed them all. That big fellow and three others stop and take care of them; and the others carry them to the hut. How they do screech! They are very large birds with a long neck, — long crooking neck, — short legs, and

heavy body. They cannot fly. They have only short wings, and the men can overtake them; but they had to run. They killed them all before they stopped to pick up any. The bird has a white tuft on the top of its head (2). One man has a little one; and, when

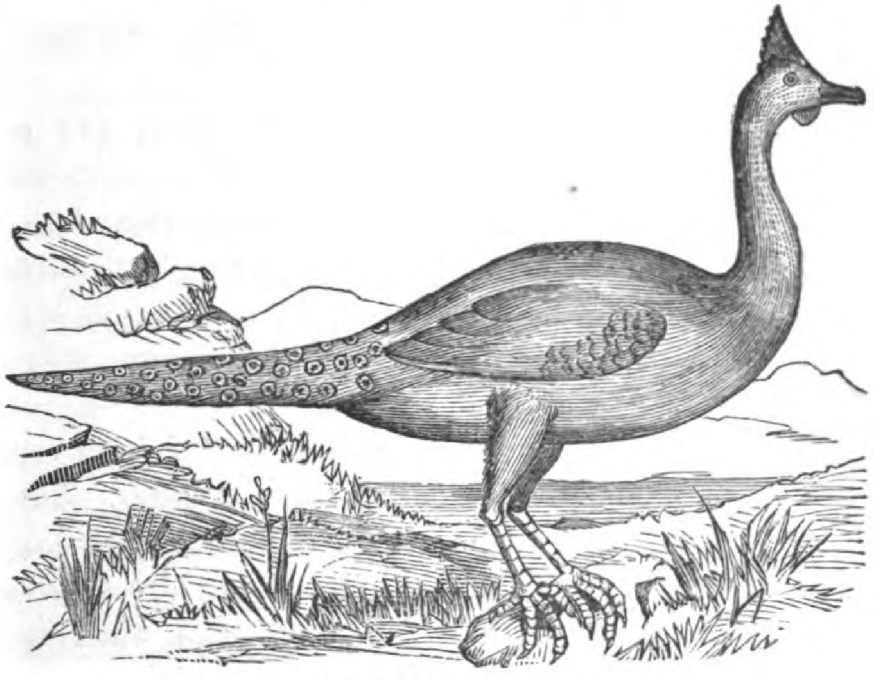


FIG. 4. — Wild-fowl in the early stone age.

he swims, he holds it up with one hand, and swims with the other. The river is not far across here. The women stay in the huts; but they give them half the birds. The men lie down now. They have nothing to do."

("See what they do when one dies.") "They make a hole with sticks in the mud, and put them in. They look rather sad, but make no noise.

"A man sees a big fish near the land. He motions the others; and they all get round. They have got

him. He darted one way and another; but they caught him. They rip the scales off, take the backbone out, and eat it raw. One man had his hand in his gills; and, together, they got him on shore. They don't seem to talk, but screech. They seem good-natured."

("See what they do when it rains.") "They all go out and take a wash.

"They have no whiskers. The women are not quite as hairy as the men; but they have more hair around their necks, and the men more on their legs.

"One quiet man has one of those large birds alive: he holds its legs. Another one has got an eel as large round as my leg. He splits it with his fingers, and is gnawing it raw and alive."

("Go a little farther back in time.") "I don't want to see such men. They don't hurt each other. They have hairs on their bodies three or four inches long. They go hunting birds and things. They are smaller, and don't attempt to talk. Farther back than that there are no people at all: there are nothing but monkeys; but they are curious-looking monkeys: they seem half man and half monkey. They have teeth like men; but they are sharper. There are not many of them. They are small. They make no huts, but live in hollow trees and such places."

Compare this description, given by a boy of nine years of age, with no more prompting than the account indicates, in the course of an hour, and without a moment's previous study, with the following from Sir Humphry Davy, giving a vision of the England of a long-past epoch: "Whilst I was still in motion, a

dim and hazy light, which seemed like that of a twilight on a rainy morning, broke upon my sight; and gradually a country displayed itself to my view, covered with forests and marshes. I saw wild animals grazing in large savannas, and carnivorous beasts disturbing and destroying them. I saw naked savages feeding on wild fruits, or devouring shell-fish, or fighting with clubs for the remains of a whale which had been thrown on the shore. I observed that they had no habitations; that they concealed themselves in caves, or under the shelter of palm-trees; and that the only delicious food which Nature seemed to have given them was the date and the cocoanut, and these were in very small quantity, and the objects of contention. I saw that some few of these wretched human beings that inhabited the wild waste before my eyes had weapons pointed with bone or stone, which they made use of for destroying birds, quadrupeds, or fishes, that they fed upon raw; but their greatest delicacy appeared to be a maggot or worm, which they sought for with the greatest perseverance in the buds of the palm."

The imagination of the philosopher falls far short of the scenes presented to the boy; and I see not how his descriptions can be accounted for, save by admitting the present spiritual existence of what has been, and the ability of sensitives to come in actual contact with it.

To those who accept the natural origin of man, the condition of these early representatives of the race will not seem at all improbable. There must have been a time when man, even in Europe, was naked, hairy,

and savage, his meals bloody repasts, and his dwelling-place little superior to that of the wild beasts around him.

Archæologists have discovered the existence of stone, bronze, and iron ages, through which humanity has passed in its development; but there must have been, preceding the stone age, a wooden age, of which, from the perishable nature of the material, we have no tangible evidence. The men seen in this examination seem to have been in this wooden age, and even in the early part of it, when clubs were extemporized for the occasion, and thrown away when no longer needed.

(1.) It is generally supposed that the primitive man in Europe was shorter in stature than the average of the present inhabitants. I think, however, that it will yet be found that he was of gigantic size and great strength. When contending with the monstrous cave carnivora, — bears, lions, tigers, and hyenas, — the law of natural selection would tend constantly to produce in him the size and strength necessary to make him victorious, as he proved himself to be, over these now extinct opponents. The Neanderthal skeleton, which is supposed to belong to the "cave period," according to Schaffhausen has bones of extraordinary thickness; "and the elevation and depression for the attachment of muscles were developed in an unusual degree: some of the ribs, also, were of a singularly rounded shape and abrupt curvature, which was supposed to indicate great power in the thoracic muscles." * I think, however, that Sherman describes a period pre-

* Lyell's Antiquity of Man, p. 78.

vious to the drift, and, therefore, probably long prior to the age of the Neanderthal skull.

(2.) The bird described by him must have belonged to the order of the Gallinæ, which includes our common fowls. It seem to have been allied to the crested peacock-pheasant, which inhabits Soudan and the Moluccas. Many animals, now found only in Africa, had in Europe, at one time, forms closely allied to them.

BIRD-EATERS AND CAVE-DWELLERS.

Nearly two years afterward, trying a specimen from Herculaneum, but without knowing any thing of its connections, he came in contact with what, I think, must have been the same, or a variety of the same, race.

"I see a savage eating the leg of a bird raw. The bird lies on the ground about half dead: he tore it off. It is a large bird. The mouth of the savage sticks out, and he looks something like a monkey. He is very dirty: you could scrape the dirt off him. His dirty hands leave a mark wherever he touches the flesh. He looks as if he had been diving in mud after that bird. I see now. He ran after it, and fell over a stick into the mud. He caught it, and hit it against a rock, and smashed its head, and is now eating it. He picks it as clean as a dog would.

"It was near a river where he got in the mud, where the water had overflowed. He has eaten the head, eyes, and every thing but the bill and the bones. It is all gone; and he is walking on. He went in the

river, swam round a minute, and washed himself, and came out." ("Watch him.")

"He is walking up the river, and watching a large fish which is in the shade of a branch. He goes softly. His hair is tough as horse-hair; not very long, not curly, but has snarls in it. It is a dirty yellow.

"He did not catch the fish. For two rods on each side of the river it is all muddy, so that it is over his foot when he walks. He sticks so, he almost gets mad as he goes along. (It is all briers and things up the bank.) I see many tracks of birds and beasts. He looks at them carefully, and seems to wonder about them. I see the tracks of people; some quite small. Here comes a whole gang; some of them babies. They come up to him, and halloo and yell, and seem to talk. They are all naked, but all covered with hairs, even the little bits of babies. One of them points to the tracks on the mud, and makes motions to them to come along. Some of them go; and now they all go, running, galloping, and hallooing. They have caught one of those birds. Some of the smartest ran ahead and caught it. The first one does not care about it. This bird is larger than the other. They snatch branches off the trees as they run. There are as many as twenty of those birds. They hit one, but do not stop to pick it up, but run on and hit more, and then come back and pick them up. Some of the birds are taller than the men; and they have to reach to hit them on the neck. They have long necks and large bodies, and take great strides. Some of the birds, after they are hit, get up, walk a little, and *sqwawk*

some; and they come back and kill them. It is just as much as a man can do to carry some of them. They grunt as they go with them. Some of the biggest carry two, — one on each shoulder. Some of the birds tremble as if they were not quite dead (1).

"Now, those that staid behind run up with the little children, and are helping to eat the birds. The one I saw before don't care for any. They must be very strong men: they have great broad shoulders.

"They have eaten them all up raw. There are eleven men, six women, and five little babies. They eat as ravenously as if they were half starved. I could hear the bones crack when they were eating. The climate is real warm.

"Oh! I see some great turtles swimming down the river; but the people do not see them. One fellow turned round and saw them: he hallooed to the others; and they see them now. One of them has got hold of a turtle's tail; but he cannot pull it out: they get hold of him, and help to pull. The turtle had to come at last. It is a snapper. They have got several. They are carrying them along.

"They have come to a cave with an entrance about as large as this room: it is on the side of the river. They kill the turtles with sticks, and carry them in. There are eight large ones. One must weigh a hundred pounds.

"I went back to where they left the bones of the birds. There are some very large bugs flying round." ("Go back to the cave.")

"They have logs in the cave, and they sit on them. There are others in the cave, that did not go with the

rest. The cave goes away in. It takes a good deal to feed these fellows. They talk with a kind of sound that I cannot make: it is like the Welsh *ll*." (He had heard me make the sound.)

"The floor of the cave is smooth. (I saw them jump when they got on some briers and thorns through the mud along the river.) The cave goes in more than a hundred yards, and widens out away in. They have rolled in logs; and there are lots of leaves between. The sun is just setting over the hills: it is coming on night now. They lie down on those leaves behind those logs. Two men have got between in one place, and a woman and a child in another. They do not cover themselves up. It is very warm. (Perhaps they were some relations of ours, trace far enough back.) They all sleep that way, — none of them near the entrance, — away back; but there are logs all the way. What a noise they make! One baby cries; and that wakens a man, who grumbles; and some are snoring. (I can see with the specimen anywhere now.)

(That's the first time I have got off the track. I saw a monstrous pterodactyl, with wings twenty feet wide, and teeth as long as eight inches. — 2.) They get up very early, — before daylight: they went to sleep before it was real dark. They sleep as if they had worked hard. The women don't catch any thing: they stay and wait for the men to catch their dinner.

"When one dies, they are sorry, but do not bury him: they throw the body into the river. I can see they have thrown a great many in as they have died. I should think you might find the bones now."

("Come down to the present.") "The river changed

into a brook that you could jump. I see some people dressed; but they still look more like animals than men. Their mouths stick out. They are not much more hairy than we. I see some hairs on their hands.

"I see nice people.

"Now I seem to have got ahead of the present time. I am in some city. Men are putting stones in the streets, so they won't wear down. Painters are painting a house. Down below there is a lot of miserable houses: poor people live in them (3).

"There were some real nice clubs in the cave, at the sides. They are large round at the end, and look as smooth and nice as if they had been whittled."

In answer to questions: "Those people were dark, very dark, — all but the little babies. It is hard to tell what color they were, they had so much hair on. The trees were all along the river, but not very close together: they were about the size of trees in Ohio. I saw some elm-trees, and some that looked like the oak or chestnut. There were vines spread all over some of the trees. The mud was black. Most of the bird-tracks were on the upper part, where it was harder. They caught those turtles by rushing into the river, and swimming and diving after them. They seized them by the tail, and then dragged them out."

(1.) On questioning him, I found that he had forgotten the description of the birds previously given, but, when spoken of, recognized them as the same.

(2.) I can give no reason for the appearance of this intruding pterodactyl. It is possible that it resulted from the examination of some previous palæozoic

specimen; though I have no remembrance of it now. It shows that great caution is necessary before we accept from psychometers statements regarding that of which we otherwise possess no knowledge. It will be found that many of the most remarkable statements in this volume are independently substantiated; and, where they are not, the reader must not dream that I wish them to be regarded as authoritative.

(3.) When he comes to Italy as it was eighteen hundred years ago he finds such a great difference, that it seems as if he had "got ahead of the present time."

ENCOUNTER WITH A CAVE-BEAR.

Two months afterward he examined a fragment of the last specimen tried, and met with similar people.

"I see a great animal that looks like a large serpent in the ocean: when it breathes, it makes a hissing noise. I am a good way back in time." ("Get at the human influence if you can." He moved the specimen up.)

"I see the ocean now, but very different. The land has sunk down a good deal. I see fifteen or twenty savages on logs in the ocean near a sloping bank. They are paddling with their hands. The logs are big,—just as big as they can get their legs across. They put a hand on each side, and make it go real fast. There is a river, or it is between a creek and a river; and they are going across the mouth of it on these logs.

"I see one now who has a big cudgel with knots on it. He has come to a big animal, as large as a cow,

and all black. He hit it a rap on the head that stunned it; and they are all hammering it. He says something. Their talk has a good many sounds in it like the Welsh *ch*. They are leaving it: what can that be for? I see now: their knives were away off, and they went for them: they are stone: they were laid up against a tree with some clubs. They made a hole in the skin by beating with a club; then ripped it down with their knives, and across, and pulled the skin off. They are stark naked, and very hairy, — all hairy but just in the middle of the face. They are very like monkeys; but they have no tails. They tear the flesh off with their knives and long nails, and eat it raw. Their nails are pointed, and look something like a dog's.

"I don't really know what kind of an animal that is. It has long claws, and looks like a bear; but it is so large, and the hair is so long, it cannot be a bear. Some of the hair is fifteen inches long. The animal was very bold and savage, and stood up on its hind-feet, and ran at him; but he hit it on the head with the big club so hard, that it knocked it down. He did not seem any more afraid of it than I would be of a kitten (1).

"They eat every part, — inwards and every thing. It is very hard for them to get the meat off the legs. A good deal of it is gristle. They make a good deal of noise as they eat. They snatch the best pieces from one another. The man that knocked it first is taking a whole leg to himself. They eat a great deal, and never seem to get filled. A very large insect stung one on the neck. It has swelled up as large as an egg. The others laugh and dance. He is rubbing it, and

stamping, and looks as sober as can be. He is holding on with one hand to a tree now, and rubbing it with the other. I believe he is going to die.

"That insect is a kind of beetle. It is more than three inches long, and has settled on the meat now: it is tearing it off with its pincers.

"That man is dead already. He lies on the ground; and the rest are laughing, and don't seem to care at all. They kick the body about.

"Now a gang of about thirty come, all with those clubs. One has a baby on her back, tied with bands of seaweeds, — one round her neck, and the other round her body. She has a big club too. The first ones ran away as soon as they saw them. They went down to the ocean, got their logs, and have gone out as far as they could. One of them fell off his log; and a fish is after him. It is a fish with the upper tail the longest. It took him as a pickerel would a frog's hind-leg. What teeth it has! Its mouth is full of them. Another one came before it got him down, and seized his leg. They are struggling for him.

"That last gang have eaten the man and the rest of the bear. (The first ones would have eaten him if they had not: they were getting ready when these came.—2.) They get mad, and beat one another with their clubs, fighting about the meat.

"Now they are tramping off, leaving nothing but the bones and skin. It looks as if twenty dogs had been gnawing there. Some of the bones are even broken to get the marrow out. They are going along through thick bushes; and there are clouds of insects like mosquitoes, but a great deal larger. They cannot

breathe without getting them into their mouths. The way they avoid it is by breathing through the nose.

"There is a very large snake coiled round a tree and a long branch, under which they go. The snake is as black as tar, and has red eyes. It is as large round as a man's body. As the last man passed, it darted down, seized him in its large mouth, and unwound from the tree so fast, that I heard the scales rub on the tree, like you sometimes hear a rope when it is pulled quickly. The snake carried the man off, darting through the woods! They don't try to chase it. They are running now everywhere, and do not keep together; running and yelling. There are very handsome birds here, as pretty as pretty can be. They have tails five or six feet long, and spotted like a peacock's. They are almost like lyre-birds.

"I have come to a level place without woods, and covered with green grass. It is beautiful. They are running over this now. There is a kind of bird eating something there; and they are trying to sneak up to it. It has a long neck and a flat bill like a duck's. It makes a curious noise, and flies very low. It is very hot here.

"The hair of these people is reddish, like the Scotch. The head is very small; the mouth stands out; and the nose is more like a monkey's than a man's. The back of the head is very flat, as if they had stood on their heads, on a board, when they were babies. Their heads are large behind the ears, where the fighting-bump is; and it seems to push the ear out of its place.

"The eagles are large black birds, with monstrous

talons, that they stick into animals. They look very savage. I see some eating a light-colored animal up in a tree.

"The sun is just setting over the water: half of it seems to be in the water. It is very hot. It seems as if every thing would die, it is so hot. One of them has climbed up a tree, and fastened himself with some seaweeds. They climb a tree well. They wet their feet, and, taking hold with their hands, walk up just as easy as if they were going up a ladder. The trees are smooth too; but they stick. The wood seems hard; and it is a long way to a limb. The sea is not far off.

"I see a black bird as large as a turkey, that walks along a branch backward and forward, and makes a curious noise, turning its head from side to side.

"Those people have all gone on trees. The woman with a baby climbed up too. There are seventeen men and five women. There are two or three in a tree. They get broad seaweeds from the ocean (there are bubbles in the inside of them; and I can push them about with my finger), and make a kind of nest of them. The weeds are very broad and strong; and they wind them over the branches, making a kind of cradle, in which they lie humped up between two branches. Some of them have their feet higher than their heads."

(1.) This animal was probably the great cave-bear (*Ursus spelæus*), which in size far exceeded any existing bear.

(2.) That the early men of Europe were cannibals is now a fact well known to archæologists. The remains

of their feasts have been found in Scotland, Belgium, Switzerland, and Italy; and, in some cases, human bones were found broken for the purpose of extracting the marrow.

THE STONE-THROWERS.

He met with the same people, but, as I think, at an earlier period, when examining a piece of calcareous tufa from the vicinity of Naples: whether from a cave, or not, I am unable to say.

"I am in a very large cave. The lime looks as if there was phosphoric light shining from it. It is splendid. The white water keeps dripping down. It is real cold in here. I see men walking round in it. There are five of them. They look like poor savages. They look scared.

"I see some coming after them. I see a faint light now: it seems a mile off. I can see the clouds now. It is quite hot. There are a great many grasshoppers here. It is not very mountainous, but rocky enough. Over the cave it seems as if the plants did not grow as well. I can follow round where the cave is underneath. There are a great many birds, and some small animals, like rabbits, that live in the wood. They are very lively.

"That cave was washed out by water, I think. I see a stream about as large as Charles River. The woods have very large ferns growing in them.

"The skin of a tremendous snake is hanging on a dead bush, about five feet high. It must be twenty-five feet long. Near it is the skeleton of some large animal, with a long tail. I think it is a mammal.

"The people here have a very large back-head. They are quite tall; but they are a very brutal set. Their eyes are of a dirty-gray color; and their hair is lightish brown, next to red. Their skin is brownish. They live by fishing mostly, I think. They have strong arms. I see them throw stones at fish in the water, and stun them every time. Then they catch them before they can get away.

"Their toes are long; and they walk with their feet spread out sidewise, — not straight, as we do. Their home seems to be anywhere, — under logs, and inside of hollow ones; among ants too. I should think it would kill a man now.

"I see a party fishing. Two men carry stones. They are the ones that cannot do any thing at throwing; and the others take them, and hit with them.

"They don't hesitate to eat them as soon as they catch them, — alive, — only throwing away the teeth, gills, and hard bones. There is a particular place where they strike the fish: it is back of the head. These men have great muscles on their arms. They are very strong, and all naked."

This tall, athletic, comparatively light-complexioned, blue or gray eyed, hairy race was one of the earliest that we have yet found in Europe, at a time when the use of fire for cooking was unknown, and, for warmth, was probably unnecessary; when stone implements were scarcely used, and such as they had were very rudely fashioned; and even wooden ones were generally extemporized for the occasion, and thrown away when the necessity for their use no longer existed. They were contemporary with a large gallina-

ceous bird, between the pheasant and the peacock, which seems to have been their principal article of diet; while many other birds existed which are now foreign to Europe. Large turtles lived in the rivers and lakes as far north as Switzerland; and monkeys and large snakes abounded in the woods. The climate seems to have been somewhat warmer than at present, and the vegetation more tropical. Enormous bears dwelt in the caves, and various animals of the cat kind prowled through the forests.

Caves were the tribal dwellings of the early people, and their places of shelter during unpleasant weather; but they wandered off for considerable distances, men, women, and children, and lodged in trees wherever night overtook them. They threw their dead into the river, near which their caves were situated, — probably because they knew not the use of fire to burn them, had no tools to dig them graves, and could in this way dispose most readily of the bodies of those for whom their affection was never very deep; for man's truly human nature had at that time been little called out.

But these were not the only occupants of the land. At about the same time, there appears to have been in Southern Europe a short, plump, brown, and hairy race, which Sherman saw when examining a specimen from Diomede's Villa, Pompeii, July 7, 1869.

ANCIENT BROWN RACE IN ITALY.

" I am in a very wild place, where high trees tower up. A little brook runs through the woods. There are large fish in it. Their backs stick out of the water.

"I see some savages; and they are so hungry, they jump into this brook, head first, after the fish. They catch them almost every time, and eat them alive and dirty. I can hear the sand grit on their teeth. They are short and thick, — chubby. Their hair is bristly. They are covered with hair nearly all over. They are brown. I never saw such straight aimers in my life. One took up a stone, and struck a bird off a limb the first time. It seems as if they could eat as much as a horse. They never seem to be satisfied. They fight with each other, and even about animals that they have not killed. They seize each other by the shoulder, and bite. They have no clothes at all. The climate is warm. Women must be born to stay in houses. I see them in a hut, waiting for the men to come with something to eat: that is the way with women everywhere.

"I saw one fellow run after a bird, and hit himself against a stone. He lies down, and howls dreadfully. Another actually came up and kicked him. What could he do that for? That is mean. They have chiefs. When they kill a bird, the chief tells them about carrying them home. They do just as he says.

"I tell you, they are lively now. They hear a lot of birds coming, — those long-legged birds, that cannot fly. They run for sticks, and get behind trees, and never show themselves, but hit them behind the neck. I think there are as many as a hundred of those savages. I never saw such a flock of birds: there must be two or three hundred. They are killing a great many. They make a quacking noise after they are hit. They generally make a noise like

quails. They have killed all they want. They lie in heaps.

"They have left them, and not touched one. They tell the women, and they tell another company; and they are making short work of them. They are carrying them home. They gave five to those that helped them. Two are as many as one person can carry, — one over each shoulder. I have seen these birds before, — many times (1).

"These men live in huts made by bending little trees over, and covering them with sods and roots and things, so that the rain cannot get through."

(1.) Three times, with specimens from Italy, these birds were seen; though in each case, the locality of the specimen was unknown. Fig. 4 represents the bird as sketched by Sherman at the time. His early sketches were rude, but were redrawn when he had improved.

With a specimen from Herculaneum, Sherman found another distinct race of people in Southern Italy that resembled negroes, and that he subsequently saw frequently. They evidently belonged to a more recent time; but the climate appears still to have been warmer than it is in the same localities at present.

NEGROID RACE IN SOUTHERN ITALY.

"I am in a very pleasant place now. It looks prettier than any place I ever saw before. Down a little way, there is quite a large river; and, a little way beyond, there are blue hills. They are volcanic hills, but not mountains, — one regular ridge straight along

for a long way, like a large wave rolling on to the shore.

"I see a tree that resembles oak: yes, there are acorns on it." ("Find the inhabitants of the country, if you can.") "I see a tree, the butt of which is three times as large as the body of the tree. It has a large swell: all of the kind have.

"I see two people by the water that look like savages. What a curious way they have to catch fish! They have a long, limber stick, sharpened at the end; and on that they have meat. The fish grab at it; and they push the stick right through them, and pull them out. The fish seem stunned, and don't stir on the stick. They look like pikes; and some are three feet long.

"The chins of the men stick out, and the nose, which is rather long. The forehead is small; and the back-head is small too. They are brownish and naked. It is very warm. They keep a fire all the time. They have something that will keep smouldering all the time. When it burns too fast, they wet it. They carry it round with them. It looks like a kind of weed. When they are fishing, they stick the other end in the ground. They cook their fish.

"The fish are very ravenous. They seize the bait before it reaches the water sometimes.

"I see another way they have of catching fish. About twenty men came; and they are all catching them. There is a very tall cliff, with a small stream pouring over it. Some of them go up the stream, and scare the fish down; and the others have bushes woven together like a net, and hold it under the fall, when the fish drop in, and they throw them out.

"These men are about the same size as men are now. They are very active, and can jump ten feet down, and think nothing of it. They go up trees, and swing the branches, and drop off, just for pleasure. The hair is dark and fuzzy, and looks something like wool. The mouth is very wide. They are not negroes; but they are something like them. Two of them have blue ornaments of some kind in their ears."

("See where they live.") "They live in a kind of hut made of bark, with skins of fish on for a covering. They are not scaly skins, but look like sharks, and are as much as six feet long. They have the hut nicely fixed. They have a pile of fish-skins inside as tall as I am. One side of the tail of the fish is very long: the other is quite short.

"I see some clubs in there, — about twenty. There are thorns on one. They are just right for striking with.

"I see something made out of clay, — very rude cups: they resemble them. They were put in the fire soft, and did not hold their shape: they are flattened down. I have seen this place before. I see a city there now."

THE MAGGOT-EATERS.

With another specimen from Herculaneum, about two years afterward, he meets with the same race.

"What time shall I look for?" ("Not very recent.")

"I see some very large turtles on the land: they must weigh about seventy-five pounds apiece. It is

quite warm. It is some tropical place; for there are many plants and animals here such as I never saw in the temperate zone. I see a crocodile now (1).

"The turtles are in a sandy place. I see holes in the sand where they have been laying their eggs. It is a very pretty place. There is a very crooked brook that I can see for about three miles. There are cranes or storks all along, fishing.

"I can see some natives of this place. They are entirely naked and black. They look like negroes. Their hair is short and woolly, their ears large, and lips thick. They are all armed with sticks. One is a little boy about eight or nine. They are walking along.

"Just as they were going along, an antelope jumped up, and ran before them. It looked very pretty. It was of a grayish-chestnut color. They did not attempt to follow it. It ran away, and then turned and looked at them.

"I see a very large nest of some kind of insect. I think it must be a bee's nest. It is not like a hornet's nest: it is flat on top. The comb is full of larvæ. The bees are buzzing all round the place.

"The savages are pelting another one with their sticks. There is no honey in any of the nests (2). The bees come out after them; and they seize them with their hands, or knock them down before they can sting." (Draws Fig. 5.)

"There are large wild melons or squashes here: they look more like the squash. One of those fellows picked up one, and threw at the nest. When they hit the nest, the bees come out in swarms, and the men run; but the bees soon return.

"Down goes the nest now. A fellow hit it at the small place where it was hung. There are small nests on the same tree, just begun. The men ran when it fell; but they are coming back again.

"One fellow pushed a pole between the pieces of comb, and ran off with it as fast as he could run; and the bees fly back to the old place as he runs. He has stopped now; and they are killing the bees that are left, — squeezing them with their hands very fast.

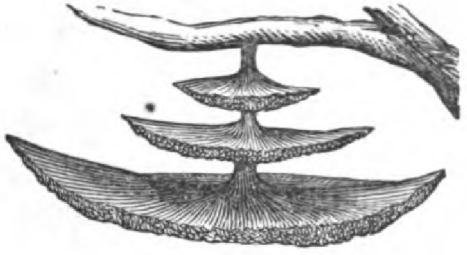


FIG. 5. — Wasp's nest.

"Oh! they are actually eating the maggots that are in the comb. They squeeze the comb; and the grubs pop right out into their mouths. Some have young bees in; and they spit them out in a hurry (3).

"They are all sitting cross-legged on the ground, each one with a piece of comb between his legs. They are eating slower now, and punching them out with a stick.

"The little fellow fares hard. He only gets what the big ones throw away; but he seems contented. He rips open every piece to see if there is not something in it.

"The nest was nearly three feet in diameter. There are only three cakes, — thick in the middle, and thin at the edges. They are very long bees, with yellow and black bodies, — much larger than common bees.

"I went back to the tree; and the bees are hanging in a great bunch to where the nest has come off. They seem all confused."

In answer to questions: "It is a beautiful and extensively wooded country, with small prairies here and there, that look as if they had been cleared.

"On a piece of the melon that the fellow broke is a beautiful butterfly, — large and black, with red stripes and spots. It is about six inches across."

(1.) As I have suggested elsewhere, I think the climate was warmer in Southern and Central Europe after the glacial period, and before the historical period, than it is to-day; and crocodiles, monkeys, and other animals and plants, flourished, that are now extinct, or are only to be found in Africa.

(2.) Although he called them bees, I think they were some variety of the wasp or hornet, as his description of them indicates.

(3.) The natives of Australia do not object to similar fare. "The Australian does not content himself with extracting the honey from the comb, but eats it precisely in the state in which it is brought from the nest. As the bees are not forced . . . to keep their honey-cells distinct from those which contain the hoard and the bee-bread, each comb contains indiscriminately bee-bread, young bee-grubs, and honey; and the Australian eats all these with equal satisfaction." *

VESUVIUS IN THE STONE AGE.

About a year afterward, with a specimen of volcanic ash from Pompeii, knowing nothing of the character

* Wood's Uncivilized Races.

of the specimen, or the locality from which it was derived, he sees a very dark, long-faced, and probably long-headed people, with long, black hair. This was probably at a still more recent time.

"I am in a desolate, rocky region. I see in the distance the remains of a volcano that is smoking.

"It seems, where I am, like a great mass of lava that has cooled. It is of a light-gray color; and scarcely any thing grows on it. There are some places that it does not seem to have covered; and there I can see grass and trees. Steam rises from cracks in it, though it is solid as granite. There are many places as smooth as glass, where it is so hot, I cannot bear my hand on it."

("Describe the volcano.") "It is not a high mountain, — not much more than a hill. The crater is very ragged; and there are numerous peaks on the wall, which is thin. The diameter of the crater is about a quarter of a mile. At the bottom it is level, but has cracks in it, from which smoke rises, and showers of sparks (1).

"I see the very same thing here that I have read about, — lava in fine threads, like Pele's hair (2). It is made by jets of lava that are thrown out, and blown by the wind. There is a great stack of it. It is very brittle; and some of it is clear as glass.

"There is a roaring noise as the steam comes out. One could not hear a man speak. The bottom is not very hot, except near the cracks."

("Go to the edge of the crater, and look over the country.") "The mountain seems high from here. I can see a long way. I see another very ancient

crater, about five miles off. About half of the crater is gone. It looks as if the lava had burst out, and swept it off.

"This is a volcanic region. It looks as if a volcano might burst out at any time.

"I see another mountain a great way off, that seems made of layers that make what look like steps from bottom to top."

("Are there any people or animals in the country?")

"Beyond that mountain made of layers, it seems like a fertile country.

"I see a couple of goats coming up the mountain that I am on. They are wild, and very active. They ran up as readily as if it had been down. They are curious goats. Their horns curve backward like the horns of an ibex.

"I see some large birds of prey, — as large as condors: they look like them. They alight on the peaks of the mountain, and are sitting there. One of them looks like a lammergeyer. I should like to know why they sit so still.

"I see a river, a large pond, and an island in the river." ("Go down to the river.")

"Oh! I see some people now, — black people. (The mountain only seems like a hill from here.) They have a rude chair, with four handles attached to it; and they are carrying their king or priest in it, while another attends to him. He is a very old man, — extremely old, — with hair as white as snow. He is laughing quite heartily as they run and shake him up. He seems like a good-natured old man. He has

braided work over him, made out of grass, and laced up in front. The others have very little clothing on." ("Are they negroes?") "No: they are not as black as negroes. Their hair is long and straight. but not as coarse as Indians'. They are of medium size, not robust, rather small. Their cheeks are thin; their faces long; and they have heads pretty well shaped for savages. They are walking along the bank of the river, and picking up shells, — for ornament, I think. One of them has a tame hawk, that rubs against him in a friendly way, like a cat.

"The old man is off his seat now, and is walking along; but he is feeble, and one of them assists him. (From here I can see jets of lava spout up from the volcano occasionally.)

"I see something very curious now. It is a double waterfall. Two streams pour over two precipices, and join in one in the air. How the steam rises! A little way below the fall, it looks like the letter X. Some water breaks through on each side. That is the strangest sight I ever saw. One river runs off the fertile side of the country, and is muddy: the other comes off the barren side, and is perfectly clear.

"These men are tattooed all over their bodies, — cheeks, nose, breast, arms, and legs, — some blue, and some black. One has a mark across his nose; and you might fancy he had spectacles on.

"There seem to be large fish in the water. They jump up occasionally. The chief is admiring the fall.

"There are a great many wild sheep here. The men look at them, but do not attempt to hurt them. They stand till the men get quite close. When they

start to run, they make a squeaking noise. The sheep and goats seem to be the most common animals here. (These men are going to make a day of it here.)

"I see fossil-fish here in shaly, dark rock. The forms are jet-black. The savages are actually examining them. The banks of the river are covered with slabs that have fossils on, mostly fishes.

"In the great chasm into which those streams pour I can see splendid fossils, large fishes; and I see fish-teeth in a red sandstone that is over the slaty rock. The teeth are mostly pavement, crushing teeth, — from the size of a pin's head to the end of my thumb."

(1.) The most ancient Romans of whom we have any historical knowledge only knew Vesuvius as an extinct volcano; but that it had been in eruption previous to the year 79, when Pompeii and Herculaneum were overwhelmed, we have abundant evidence. The pavement in the streets of Pompeii was made of lava-blocks, the product of some previous eruption.

(2.) This is a very common phenomenon in eruptions of Kilauea. Mr. Stewart, a missionary in Hawaii, gives the following account of his observations during an eruption: "A whole lake of fire opened in a more distant part, two miles in circumference. Its surface had all the agitation of an ocean: billow after billow tossed its monstrous bosom in the air, and occasionally met with such violent concussion as to dash the fiery spray forty or fifty feet high. This spray is blown out by the winds into delicate threads, as melted glass may be drawn out; and accumulates on the sides in masses which resemble bunches of tow." This the natives call Pele's hair.

THE GOAT-SUCKERS.

The next evening, with the same specimen, I asked him to find the same men, if possible; but this he found it very difficult to do. He found himself near the ocean on a wet, windy, and chilly day. He turned the specimen over, and then was in a large swamp, "all tangled up with a yellow vine." While examining it, he suddenly exclaimed, "Now I am where I was last night. I see numerous trees on one side of the river formed by the union of the two streams, with many fungi on them. Some of them grow out a foot from the tree.

"I see those people now. One of them has a tame wading-bird, walking along with him like a dog. It is about two feet and a half tall. As the frogs jump into the river, it springs after them. These men seem to like tame animals. This bird has a crest that it can raise at pleasure. Its cheeks are white; so that it looks almost as if it had a collar on.

"The old man is with them. The crane can fly as well as any. It will not allow them to handle it. It slips off when they get within about a foot. They have some weapons with them now, — spears." ("How are they made?") "They are made of wood, with a one-sided bone-barb on the end. It is very sharp. I should think they must have rubbed it on a stone.

"They are trying to catch fish now near the falls. The fish are trying to get up; and they spear them. The crane is with them, and, every now and then, gobbles a fish down. The fish are not very large, — about the size of a herring, — and have large scales."

("See where the men live.") "They live in conical huts made of poles, that come together at the top; and strips of bark cover them to make them waterproof. Some of them are very nice. There are rich and poor among them. There are a great many together. The people here have been fishing; and they have three or four barrels of some large fish, and are cooking them. One of the huts is on fire, and they are trying to put it out; but it is useless. The people are running out, and getting their things out. The man looks as if his only home was gone. It makes quite a light all round.

"When they are eating, they look savage, they are so black, and their teeth so white; and they take large bites, — half a fish at once. Some of them have birds to eat, — large geese, that they have shot with arrows, I think."

("Is there a family in each hut?") "That is what it seems like. I see them fight with one another, — one family with another. They quarrel about their children. I see one put a piece of fiery coal on another's toe to make him jump. (The hut that was on fire is all down now.)

"The little children are chubby, with round faces. Some are naked. It does not seem very warm. The little fellows are all the time fighting; and the big ones look on and enjoy it, just like a dog-fight. They wrestle a good deal more than they fight. They don't throw one another; but when one gives up, and says something, the other lets him go.

"I see trees that look like the banyan. They have branches that have grown down and taken root; and

some are growing down. They spread into different branches before they reach the ground, as if they knew they were going to take root. Those fellows do tricks among them, climbing and swinging about like men in a gymnasium. I see two branches that have twisted about each other as they grew down."

("Do you see any domestic animals?") "They have goats and sheep here, tied to trees. They don't milk them into a pan. The fellows creep under them, and suck them. The goats get angry, and kick sometimes. I can see two men under one, bumping like two kids (1). They fool so much, that they sometimes get angry, and fight in earnest.

"One man saw another lying down to suck a goat. He slipped round to the other side; and, when the man opened his mouth, he put his toe in. The man did not find it out at once. Don't they laugh! They play worse than any boys.

"The party that I saw before has come home. The old man has the best place. There is a long street, with huts opposite one another. The chief's tent is in the middle: it is the largest and best. He has several wives, — as many as six, I think. Some of them come out to meet him as he comes home.

"I see one man with his arm off a little above the elbow. He uses it considerably, though.

"It is quite dark now. The men run round, and throw up sparks to look pretty. The boys are a roguish set, — full of tricks. I see one set a coal of fire where another is going to sit down. One of them kneels down behind another; and then a third one pushes the second over the first. The women hate to

see it, and try to stop them. They play very harshly; but those that suffer never cry."

(1.) Fig. 6, from Wood's "Uncivilized Races," represents a boy of the Namaqua tribe, in South Africa, sucking a goat; but they are said to abandon the practice when they become men. Men, it appears, were all boys in the primitive times.



FIG. 6. — A Namaqua sucking a goat.

COOKING A WILD PIG.

A month afterward, with a specimen from Nero's baths (the locality equally unknown), what appear to have been the same people were again observed.

"It is night, and I am in a large forest. There are many savages round; and they have a fire. There is something cooking; and they are dancing round. They are very black; and their eyes shine like silver. Some of the boys are completely naked. Some of them have huts made of boughs on trees that are easy to climb. There are no sides to them, but just a floor

and a roof, made of woven boughs, and bound with bark.

"The people are about all of a size,— as large as a medium-sized man. They have sticks like a hockey, that they play with, knocking things round. They are roasting what looks like a wild pig; but it is so burned, I can hardly tell. One man attends to it. I can see the hoofs. It is hanging over the fire from a stick placed on two notches. There is a snake, too, roasting by the side of it. I did not see that before.

"They are heaping ashes and dirt on it, so that it may not blaze. There are sixteen of them. I see no women. There are some boys; the smallest about twelve.

"They have got the pig off now. It is well done. The skin and hair come right off; and they pull the hoofs off. They don't stop to pray. They attack it, all hot, with their bare hands. They never took the inwards out. I saw one fellow nibbling at the hoofs, that were steaming as he pulled them off.

"I see two fighting now. One took some of the hot pork and threw at the other, and hit him on the cheek. One attempted to run away with a leg; and two or three ran after him, and brought leg and him back. What noises they make! They hallooed to him, and he back. I could see the steam rising as he was going.

"Another tried to run off with another piece; and two ran after him, and switched him, and brought him back. Such mouthfuls as they take! The grease shines on their faces, from the reflection of the fire, from ear to ear.

"I saw a trick played just now. One seized a leg from another, and ran; a third ran after him, and struck him with a switch; when he dropped it, and the other commenced eating it. He is skulking at the root of a tree among some brakes, and is eating ravenously. Some of the others are hunting after him. The steam rises from the meat, and shows plain. I wonder they do not find him (1). They do not talk as loud now.

"There are a great many rope-like vines here. The forest is very thick, and the ground is all tangled over with them.

"After the supper, they lie down with their feet to the fire, and talk quietly. The little boys are picking up pieces from the dirt, and cleaning the bones.

"One fellow saved a choice piece; and he turns over and quietly eats while they are talking, but is careful not to let the rest see him. The little fellows have very squeaky voices.

"I think they are out for a hunt off from the place where they make home. They seem to come here now and then to hunt.

"Some of them look quite intelligent. They are not negroes, and their foreheads are pretty good."

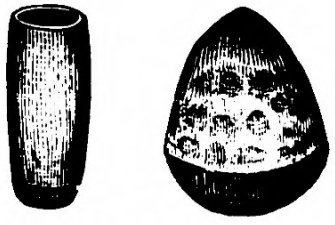
(1.) It is probable that the steam showed much more clearly to him than it would have done to an observer on the spot.

EARLY MEN OF ITALY COOKING AT A BOILING SPRING.

JULY 1, 1873.

With a specimen from Pompeii, he meets with the same race again. I said, "Do not go back beyond the human period."

"I see some savages skinning a large monkey. There are three of them; and each has a knife of bone, that he draws along and cuts with." (Draws Figs. 7 and 8.)



FIGS. 7 AND 8. — Bone knives.

"I think the long one is made out of an elk's horn, because it is hollow at one end, and not at the other, and looks like that. There is a stone near that they sharpen them on."

("Describe the men.") "They are very dark,—one not as much so as the others: he is more the color of an Indian. There are feathers in their hair; and they have skins that partly clothe them. Their hair is black and long and straight." ("Are their eyes straight?") "They are slightly oblique, like a Chinaman's." (Draws Fig. 9, but complains that he cannot give a true expression to the face.)

"They have the monkey skinned, and are fastening it on the ground with sticks to dry.

"These knives of theirs cut first-rate." ("What are they using them for?") "They are cutting holes to put the sticks through.

"I see some other ones, with their eyes still more oblique: they look like Chinamen, only darker. They have high cheek-bones. There is a troop of them.

"They are having some kind of a dance round the

skinned monkey. Their backs are turned to it; and they have hold of hands. They hop three or four times on one leg, and then on the other, and keep shouting all the time.

"They are in a favorable place. There is a hot spring within a hundred feet in the woods; and they are going to put the body of the monkey in it. The entrails are taken out, and it is ready to cook.



FIG. 9.—Native of ancient Italy.

"There is an eagle on top of a large tree near the spring. They have cooked thousands of animals here. I can see the bones of fishes, birds, and mammals of various kinds.

"The monkey is in now. The water is nearly boiling-hot. The stones seem to be hotter than the water; for, when the water splashes on them, it hisses.

"The spring is quite irregular. At times it is calm, and one can see the sides a great way down; then it

will boil up, and rise two or three feet, and then sink down again. (That is very strange.) Steam rises from it all the time.

"The monkey looks fearful. The skin and hair are on its head.

"This eagle seems almost tame. It comes down where they are, and they do not touch it. It is eating the entrails of the monkey."

("Do you see any women?") "No; nor children. They are all men. They are dragging it out now; though it does not seem to be more than half done. They have hard work to get it out. One pulls a little, and then another; and they change hands, and pull again. You should see them blow their fingers! Their knives are useful now.

"One was so intent to get his share, that he forgot the spring would boil up. It splashed on his back; and he runs off, making an ugly face.

"All have scars on them. Some look as if their arms had been half cut off.

"They are talking all the time." ("Cannot you tell some of their words?") "At times they get something they do not like, or burn their mouths; and they shut their eyes, shake their heads, and say what sounds like *go ulch;* but there is a sound in it that I cannot make." (He thinks it resembled the Welch *ll.*) "They say what sounds like *yah-bij-e-vah*, a great many times.

"When the spring boils up, they call out '*Mo-rah*' very loud. Their laugh is hardly a laugh at all, — a low, monotonous ha, ha, ha!

"The eagle comes close to them; and they give it

meat, and seem to reverence it. I believe they look upon it as a kind of god. It flapped its wing, and hit one man on the head; but he never touched it.

"They all keep their eyes on it as they eat, — all the time. It is quite large and brown. It has what look like eyebrows, that give it a cross, ugly look.

"I think I could learn their language. When one has a large piece of meat, and they want some of it, they say, '*Mo-kah-rah.*' They repeat a great deal.

"The eagle is satisfied, and has flown into the tree again. (Every noise I hear just seems to be there in the woods. When you speak, it often seems to be where I am.)

"They certainly do say '*Mo-rah*' for that fountain. I have heard it a dozen times; or it may mean, 'Be careful.'

"I see a large turtle-shell three feet long: they must have devoured that."

The last four examinations refer, I think, to the same race, which seems to have been the parent of the present Mongolian, the main stem of the aboriginal American, as well as the Central, Northern, and Eastern Asiatic populations. Originating, perhaps, at a very early period in Asia, it may have sent wave after wave to the east and west, but is only seen in Europe to-day by slight signs that mark the descendants of the races with which it amalgamated.

EARLY MUSICIANS OF ITALY.

Four years before this, with the same specimen, he described what I think must have been a similar people to the so-called "cave-dwellers of the Dordogne," arising, probably, from a mixture of races.

"I see a good many people dressed like Indians. They have a kind of reed split at one end, and flattened; and they are blowing with all their might. They have other things, — hollow plants. The best are the crooked ones: they make the biggest noise. There is a kind of plant that is hollow, and has joints. They have pushed a stick through; and, as they blow, the joints spring forward, and then come back. It sounds very loud.

"They are in a wild place; but they like music as well as any one. They are going along, blowing and dancing and shouting. We should call them 'a band of horribles.' I see one thing that two blow on: it has a hole in the middle. It makes a kind of shrill whistle.

"They are brutal people, but have white teeth, which are as regular as can be. They are brown, a kind of reddish-brown, — a very dull brick-color; tall as men are now, and stout, and very active. (It is dying away now. It is all dark.")

POMPEII AND THE POMPEIIANS DESCRIBED BY AN EYE-WITNESS.

What the Egyptians did for the bodies of their friends by art, Nature did for Pompeii. It is an embalmed city. We look upon the mummy, and see the very body that walked about three thousand years ago, — the fingers that handled, the feet that trod, the teeth that ate, the very body that his friends recognized; but the spirit that constituted the real man is gone. We can learn much from the mummy; but there is more that it does not reveal. And it is thus with

Pompeii. Here is the city, — its temples, its tombs, its streets, its stores, and its private houses, the fountains where the citizens drank, the baths where they washed, the theatres where they laughed and cried; but the soul is gone. Where are the people that surged through these narrow streets, that jostled each other in the little stores, that went sailing in the handsome boats depicted on the ancient walls? "Could we but see the city as it was," says the visitor, "one glimpse would teach us more of living Pompeii than a year's examination of dead ruins."

Psychometry raises the dead. As the telescope brings the distant in space nigh, this brings the distant in time. To the spirit, all things are present; and, to him who sees with the spirit's eyes, Pompeii, the buried city, is instinct with life. He glides among those ancient Pompeiians like an unseen ghost, watches the countenances of the passers-by, hears the laugh, notices the quarrel, hovers over the dinner-tables, watches the guests, and beholds all things as they were, — the living city, unburied by the fallen cinders, undimmed by the breath of time, undisturbed by the rushing centuries.

The next eighteen examinations were made by Sherman, who, in nearly all cases, was not only ignorant of where the specimen came from, but of what it was; though, in the examinations of the statuette and lamp, he must have known that they belonged to an ancient human period. His knowledge of Pompeii was extremely limited, his reading having been confined almost exclusively to works on natural history; and he is generally quite unwilling to examine any thing

connected with civilized or enlightened races. When rewriting from the notes taken during the examinations, questions that are not indicated were frequently asked him in reference to doubtful points.

THE STREETS, HOUSES, AND BOATS.

OCT. 17, 1872.

The specimen examined was a small piece of plaster from the house of Sallust.

"I see a man going up a ladder with some mortar. Men are building a house of light-colored brick. It is in some foreign country. It seems to be in a city. The streets are wide, — as wide as the widest streets of Boston (1). There is a fence between the sidewalk and the middle of the street. Every little way on the sidewalk there is a board about three inches square, with something written on it. Every house has a space between that and the next, about three feet wide, — room for a man to walk between easily.

"The houses are handsome, and especially the doors. I see in one place — over a door — a representation of a man with a spear attacking a dragon: he has one foot on its back. It is engraved in stone.

"Over another door I see two children dragging a cart, and one riding in it; and they all have wings (2). (Fig. 10.) Most of the good houses have something of the kind over them.

"On the sides of the door there is polished stone, and figures cut in it of men and horses and boats, with many oars in water, and men rowing. They are very well done. They look like pictures, but have no perspective."

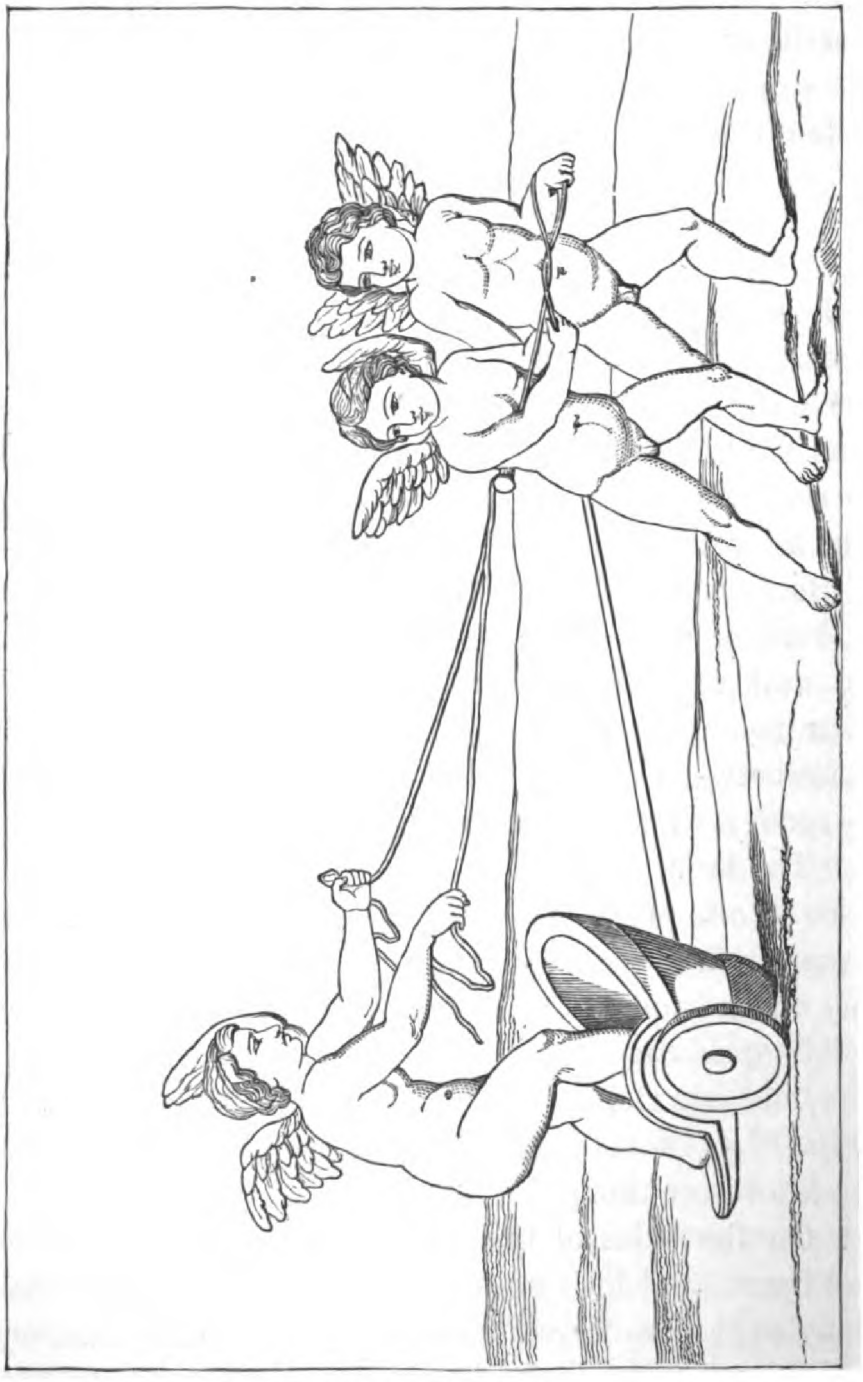


FIG. 10. — Painting found in Pompeii.

("Can you see people in the streets?") "Yes, all the time. They look like Irish to me."

("How are they dressed?") "Some of them are not more than half dressed: many of them have their arms bare, and their legs up to the knee. All the laborers are like that. I see others that are dressed all over, and have more dress than they need (3).

"I see a statue now. It is a very odd-looking thing. The nose is a foot long. It has a little head, and a hat on it. It is made of stone, but is not smooth.

"On a tall pole, in the middle of the street, on a cross-piece, is a lion, with his paw elevated as if to strike.

"I see a large river now, and people boating for pleasure. The boats are shaped like birds, — geese, swans, and so on. Some have heads on. One has the head of a man. They are very handsome. Some are nearly as wide as long; and but a small part of the boat rests on the water (4).

"The men row very prettily: they keep excellent time. It seems to be the principal pleasure of wealthy people to ride in their boats."

("How are the ladies dressed?") "They have dresses made of rich and handsome stuff, with all kinds of figures on. They have very large sleeves, that are open and hang down."

("Examine some of the stores or private houses.") "I am in a store where they keep dishes for sale. Some are very large, and have beautiful figures on them, — of men, horses, boats, and other things. I see a large one made of copper, I think; and in

the centre is a man in a two-wheeled wagon, driving over another: all around the edge are smaller figures. There are a great many for sale. I see a number with the same figure on. They must have some way of stamping them. (I have to look closely to see. I wish I could see well.") (Long pause.)

"The laboring-people seem to hate the rich. Where there is a number of them together, the rich pass them quickly, and seem to regard them as a man would a snake. They are not afraid of them; but they seem to despise them."

On questioning him, he said that the men who rowed the boats were dressed all alike, — "with red jackets that looked like red flannel." He also stated that "the streets were very clean, and the back of the houses looked just as clean as the front. Every thing was neat and in order."

(1.) Having read that the streets of Pompeii were exceedingly narrow, I thought there must be some mistake about this; but I discovered that the residence called Sallust's house stood "on an area about forty yards square,"* and had broad streets in its vicinity.

(2.) Fig. 10, from Aine's Herculaneum and Pompeii, represents a painting found in Pompeii. Sherman says it is identical with what he saw, except that what was over the door had a triangular border. The engraving was not seen by either of us till after the examination.

(3.) The way in which some of the laborers

* Pompeii in the Library of Entertaining Knowledge, p. 85.

dressed may be seen in Fig. 14, the sign for a wine-shop, where laborers are carrying an amphora. Those who had more dress than they needed were probably the wearers of the toga, that sometimes reached to the ground.

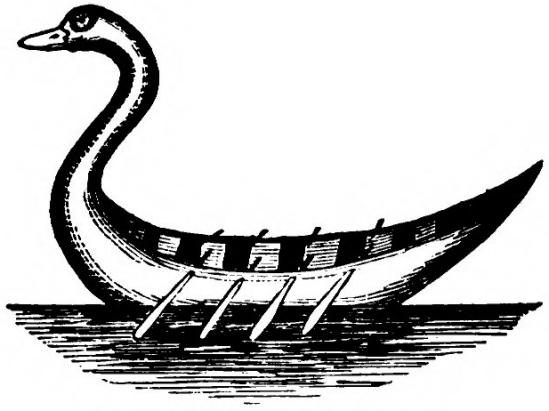


FIG. 11. — Pompeiian boat.

(4.) Fig. 11 is engraved from a sketch made by Sherman during this examination. The swan seems to have been taken as a model for the whole boat. A ship was sometimes named by the ancient Romans "The Swan," having a swan carved upon the prow. Fig. 12 is copied from paintings found at Herculaneum, and represents the *cheniscus*, which was generally attached to the prow of a vessel, but sometimes to the stern.

POMPEIIANS BOATING AND FISHING.

OCT. 18, 1872.

The next evening the same specimen was tried again; he knowing no more respecting it than the psychometric representations had given him.

"I am not in the same place as I was last night. I am on quite an elevation, — a little hill. I can see the

river, and across it, where they have begun to build. The place is not near as large as on this side.

"I see near the river a lot of little houses, boarded on the back, and with cloth roofs of different colors. They are places for selling things. I see some kind of sugar for sale. There are tools for boats, and fruits of different kinds. I see one that looks like a lemon. The fruit is in bags made of coarse grass or reeds, — something like the bags that dates come in. They have fish-hooks too; but they are curious. I could not think at first what they were. They are white, and made of ivory, I think, with a hole to attach the line to. There are many things here that I cannot tell what they are for.

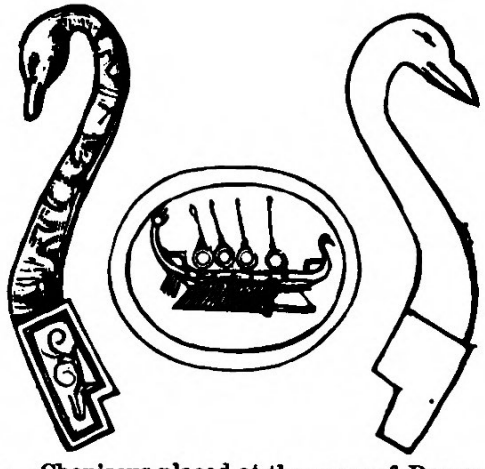


FIG. 12. — Cheniscus placed at the prow of Roman vessels.

"I see fish for sale in another place. I see one that looks a good deal like a cat-fish. There are small fish, about a foot long, with very sharp teeth that slant outward. The people do not seem to get a great deal of custom.

"I see some people that are dressed up like soldiers,

who are walking round, and do not seem to have any thing to do (1).

"Men are catching fish off the piers that are built for people to get off and on the boats.

"The boats are all nicely lined with cushions, and have mats for the feet. I do not see how they get them so tight. They are perfectly dry.

"The people who go in them carry luncheon in pretty boxes, that are inlaid so as to form pictures of various colors. On one box is the outline of a stork, and fancy scrolls round the edges (2).

"I do not see one sail-boat; but there is not a breath of wind now. The boats go down the river, where there is a landing and pleasant groves. Some of the boats look like a large bird a good way off. The people sit fore and aft, and the rowers are in the middle. One man at the end steers.

"Some of the fine people who go out fish. Those small fish I spoke about bite very readily, and they pull them in fast.

"One lady was scared. A gentleman pulled in a fish, and brought it near her face. They catch fish, and let them go again.

"I think the river is very deep. It is very still. I see no signs of a current. The country is level as I go down.

"There is something growing here that looks like sugar-cane. People are going to the city with produce. It is a delightful country round here. I see birds,— some large, red birds."

("Can you examine the city?") "I am not interested in that.

"I see some loungers in a store. One of them turns from one thing to another very slowly. He has a long beard: he is an odd-looking man. It is a fish and fruit store: they sell both together. I see what looks like turnips."

A JEWELLER'S STORE.

"In the best stores they sell jewelry and rich clothes. In a jeweller's store I see round balls of polished agate, or they look like that, attached at the polls, so that they can be rolled round. They are held by a golden clasp, that is ornamented with little figures. They are beautiful things. I see another pretty thing. It looks like a silver fruit-dish: it is quite large, and very finely polished.

"There is a row of spears, swords, knives, and daggers, and one cross-bow. It is fixed so that the arrows are guided in a sort of barrel.

"The stores are not as thick here as they are in our cities."

A TEMPLE.

("Are there any public buildings?") "I see a place that looks something like a church (3). A great many people are going in. There is music here; very nice music. One instrument is like a harp: a man picks on it with his fingers. There is one like a triangle, and another like a gong. The band is on a platform. The people stand up. I see no seats.

"Oh! I see a number of pipes of various sizes; and a man puts a tube, that wind comes through, to each pipe, according to the note he wants. He is skilled at

it. He can shut off part of the wind. A man below turns a wheel that has a belt attached to a small fan-wheel, that drives the air into the tubes."

After the examination, in answer to questions: —

"The tube was flexible, and could be easily applied to the different pipes. It had a joint at the bottom; and the tallest pipes were nearest to it.

"Down in front there was a space; and a man and a woman at each side were dancing to the music: they kept pretty good time.

"The door of the church was very high and very wide, — thirty feet high. There were a great many people; and the men had long beards.

"Those rich people seemed to own those that rowed in the boats: they went down with them, and returned with them" (4).

(1.) Military colonies were sent to Pompeii under Augustus and Nero.*

(2.) Similar boxes with mosaic figures are in use in the vicinity of Pompeii to-day.

(3.) A temple, doubtless; of which there were many in Pompeii.

(4.) Among the Greeks, "the rowers on board the ships were usually slaves;" † and it was probably the same among the Romans.

FEAST IN A TEMPLE.

OCT. 20, 1872.

Examination of the same specimen continued: —

"I am at the door of that church again, first

* Anthon's Classical Dictionary, art. "Pompeii."

† Dictionary of Greek and Roman Antiquities, art. "Servus."

thing. There is a certain class of people here that dress very plain, and all alike, — all the men alike, and all the women alike. They are in the middle of the building, in two rows. These women wear a sack, with sleeves that come down to the elbow, and a ruffle round the hips about a foot deep, and pants that are large, like a sailor's.

"The sides of this building are very beautiful inside: there is no telling the beauty. There are a great many figures that look as if they were made of copper. There is a great deal of scroll-work.

"Back of where the musicians stood there is a representation of a man, about five times the natural size, with a bow, preparing to shoot at some animal that crouches down. It does not represent any living animal. It is merely an imaginary one, and has feet like a bird. It is cut out all round, and that makes it stand out in relief. It is painted. It shows the muscle on his arm extravagantly large.

"A man is talking now. He uses his hands a good deal; and now and then he thumps his fist, as if he was mightily in earnest about it.

"Why, this seems to be more a place of pleasure than of piety. They laugh at what he says sometimes, and he slightly smiles himself. His speech was quite a short one. He has sat down, and they have commenced to play again. They have chairs for the musicians; but they are curious ones. There are no backs to them. They are square boxes, with a round top; but they are handsome.

"Now the people that were dressed all alike are going out. They leave in regular order; but I cannot

tell what for. The music is strange: it does not sound very musical to me.

"I see what those people went out for. They went round back under the platform, where there is a room; and each one took a dish; and they are going round to give them something to eat. Most of it seems to be fruit, — grapes, lemons (or what look like them), and melons that look a musk-melon; but they are smaller. They pare them, and eat them in slices. There are small seeds in them, which they put on a plate to be carried away.

"The preacher has a plate all to himself, of nothing but grapes. The plates are large, brown, and about three inches deep. They don't seem to believe in fasting. The grapes are very large and oval. Some people bring up water.

"I guess it is only those that are invited who come; for each has a ticket. It is made of leather, and stained crimson. It is in the shape of a diamond, with rounded corners.

"The pocket to a man's dress is on the outside; but he gets at it from the inside. It is opposite the lowest rib.

"Every one carries some kind of little tools, — for cutting in wood, I think. They are made of copper (bronze?) too.

"They are all going out now; but the band is playing all the time. When they are out, there is quite an echo. I hear it even when people walk about.

"This seems to be some kind of society that help one another, and meet to have a party and a general good time now and then. They did not give their tickets up.

"The tools were for cutting wood or stone. Those that waited on the others seemed to be of the same class; and I think they took turns, — one waiting at one time, and another at another time."

This may have been an association of artists who had occasional feasts, as Freemasons and Odd Fellows do at the present day.

SCULPTORS AT WORK.

Oct. 21, 1872.

Examination of the same specimen continued: —

"I am in the same city again. It seems different from where I have been before. It seems higher. I cannot see well to-night.

"I see a crocodile or lizard cut in stone above the door of a house. Some doors are single, some double, and some slide. I can see the river; but it is quite a way down.

"I see some men making something like a lion in stone to go on a house. Three of them are at work on it; and they do it very fast. It is drawn on the stone with chalk; and the man follows it with a chisel, and cuts it very true. (One got a piece of stone in his eye: he rubs it very naturally.) All three work on the same stone at once. Their hammers go thump, thump, thump.

"Outside of the city, over the hills, men are tending sheep. They dot the hillsides. There is quite a ridge of hills from here along the river, but off a little way. The boats look beautiful from here.

"The river bends and winds round. I should think there might be fever down there. There are swampy

places, with coarse grass growing on them. It seems quite early in the morning. People from the country round are bringing in produce in boats.

"They have fine weather here, I think. There are only a few white clouds in the sky this morning."

A POMPEIIAN MOB.

OCT. 24, 1872.

Same specimen: —

"I am at another place, considerably smaller. It is on a river; but the country looks different. It does not look as well. There are some nice-looking houses; but nothing looks as it did before (1).

"It is the same place; for I can see the rock where those people landed. There seems to be trouble among the people here. There are two sides in the town. One side seems to be a mob. They are not fighting, but threatening. The mob in the street will not let anybody pass.

"They are walking through the streets now; and everybody that sees them runs. They have sticks and any thing they could lay hold of. They have come to a man's house, and are breaking in, and destroying every thing. They are throwing stones.

"There is a man at the top of the house. He took off some bricks from a chimney, and knocked a man down with one. They are setting fire to the house now. It is burning. This man on top will have to take it.

"I guess the mob will have to take it now. A regiment of men are coming, armed with spears, and bows and arrows. The mob runs in every direction. The

soldiers have killed several. They run the spears into them, and shoot them as they run. They are miserable cowards to do that. I saw a soldier send an arrow right through one man. Some are putting the fire out. None of the mob is to be seen now, but the dead and wounded.

"In this town all the houses are together, as if for protection. There are none scattered outside, as in our towns.

"The soldiers are in some kind of armor. They have helmets on, and wear feathers. They look very much alike. The visor of the iron cap comes low; and, to see, they have to hold their heads up when they run. The soldiers are getting into order again, and going back. Some are carrying the dead to the river, and throwing them in, after fastening stones to them.

"They have got the man that threw the brick down, and are carrying him off. I cannot imagine what that is for. They hold him as if they were afraid he would run away. They are talking to him. They have let him go now; and he is going back toward his house. He goes shaking his head. He is very angry at somebody. He looks at his house as if he were ashamed of it. The fire is out; but the door is smashed.

"He is going round inside to see what damage is done. There are handsome vases of a glossy black, with blue flowers on the outside; and they are of handsome shape. He has pictures: one is of a boating scene. It is not very well done, — something like the pictures we have on curtains or carpets.

"There are singular scalloped picture-frames: they

are a glossy black. He seems to esteem the pictures very highly.

"He seems to be a philosopher. He has globes and wheels, with weights and machinery of various kinds like models. The room where they are is not damaged.

"He has a chair with three wheels on it, so that it moves readily. He has a vice; and there is a piece of iron in it now. There are also several brushes and bottles.

"He does not seem like a bad man; and the mob seem to have attacked him because he undermined their religion.

"There are several slabs of stone in the room, in which he is cutting fine figures. He is a sculptor as well. He must be a scientific man. He has a large wheel, and a belt that goes to a small wheel for polishing."

After the examination: "The mob had brutal-looking faces. Some were not more than half dressed. Those soldiers thought no more of killing a man than we would of killing a cat."

(1.) This was evidently at a much earlier period in the history of the city, and probably before any record that we possess of its condition.

A POMPEIIAN DINNER.

Nov. 12, 1872.

Same specimen: —

"I guess I am at the right place now; but the city seems larger than it was."

("Find one of the best private houses, and describe

it, and the people in it.") "I see a very handsome house now. There are stone steps up to the door, and a metal scraper to take the dirt off the feet. The doors slide into the building: they are of wood, and have figures on them. There is a picture of a man shooting with an arrow on the wall outside. He has a crown on his head, and is twice the size of life. It is painted black.

"The hall is broad; and there are stairs on the left hand, a little way from the door. The hall and the stairs are carpeted; and there are figures on the carpets. On the hall-carpet there is a representation of a man killing a lion, and a number of men spearing a monstrous animal, — a kind of reptile with a hooked bill like a bird. The stair-carpet has crosses and stars on it. On the walls of the hall are skins of crocodiles, snakes, and such like; and an imitation animal stands up near the door for a hat-rack. The ceiling is painted all over too. Tall birds stand up in order.

"On the right-hand side of the hall is a kind of parlor, very beautiful. On one side of the room there are several long shelves, one above another, to put things on. There are very beautiful shells on it; and some are cut into faces and images of various kinds. I see one with a high spire, that is made into an old woman sitting in a chair. The top of the shell is her hat. I see another shell made to represent a string of fish, with their heads hanging down. This one has a short spire. Along up the walls are pockets containing flowers: perhaps they are artificial. It is the most beautiful room I was ever in. They are not ignorant of the use of rocking-chairs. The rockers

are an arc of a circle, and have no hook at the end. I never saw as beautiful a room. There are two doors out of it. The wall is brown, — about like a brown jug in appearance, — but smooth.

"I see a frame with writing inside. There are some pictures on the wall, and some riddle pictures, or what look like that, — part writing, and part pictures. There is a round object made of metal, polished, — half a ball. You can see your face in it. All over the ceiling and sides that are not occupied are little figures in relief.

"There are several statues, and a solid picture, — mountains, rocks, and people sitting on them; one pounding. I see a picture in outline of a man smoking a pipe as long as himself (1).

"The next room seems to be a dining-room. I see a great many dishes, some of them very beautiful. Every thing is artistic. The table is set too. There is a large fish two feet long, cooked whole, head and all. These people seem to have slaves. I see them putting the things on (2).

"I see very curious spoons: some have two bowls to one handle. There is something like a castor-stand with a handle, and long things in it like bottles; but they are crockery. They have molasses and vinegar and such things in them, I think. The plates are very large, and glazed.

"There is only one knife: that is to cut the fish up with.

"I see one strange thing. It seems to hold salt; and at one end there is something like a bladder, which they squeeze, and the air blows the salt out with

it. It has a valve at the other end. They have it for other things as well as salt. It is very handy. That bladder feels like rubber; but I don't suppose they had any then."

("Where are the people?") "They are not in yet. One lady seems to be telling the slaves what to do. The table-cloth is handsome, and seems made of braided rushes; but it is smooth. The table is round.

"The people are coming in now. There is a very large man: he strikes three times with the end of the knife, and then they all commence. There are seven of them, besides a small girl and a little baby.

"They have a curious kind of grater. It is moved back and forward with a handle. As the powder falls on the fish, it melts."

("What do they drink?") "They have something red to drink, — wine, I think. It is a pretty, rich color. It is thicker than water. It is sweet as maple-sap when it comes out of the trees (3). It is flavored too.

"In the centre of the table is a large wheel that has a number of little vials on it, with different flavors, that they use for their wine. They are of different colors; and there is writing on the outside to tell the kind.

"I tasted one of the essences: it was like the juice of lemon. Some are sweet, some salty, and some even bitter. The wheel seems to be made of silver, and is about a foot high. They whirl it round when they want any thing.

"They use forks and spoons, and the double spoons to get two mouthfuls at one dip. They have many things that seem made of silver. They have some-

thing like a little shovel, that they use instead of a knife.

"The slaves are eating in another room, that is under the stairs. They do not say any thing while they are eating. There is a pair of stairs back of that, but not near so nice as the other.

"They do not believe in eating hot things. All is cold, except the fish. They eat the eyes of the fish. There is a depression on the plate, where they put what they do not want, — scales, bones of fish, and such things. The fish was stuffed, and sewed up again. Every thing is in grand style. Every one has a napkin.

"I noticed one hold up his hand, then another; and, when all had done so, they got up and left. The large man was the last. They rise orderly. They do every thing in order."

("Where do they go?") "The men went out of doors, and the ladies up-stairs; but they all washed their hands and faces before that. They have pumice-stone here to rub off the dirt."

("Can you see where they sleep?") "There are no sleeping-places in this house, — not one. I do not see a bed." ("Did you go up-stairs?") "Yes: I went everywhere; and I see nothing that looks like a bed (4).

"I see bathing-tubs, made of some kind of metal, of the same shape as ours. They have warm and cold water too."

In answer to questions: "They do not look as well as our most intelligent people now. The women looked weak and feeble. The slaves had short dresses on.

"It did not look well up-stairs. The women sat up there. The men were out of doors most of the time."

(1.) It is generally supposed that smoking was unknown in the Old World before the discovery of America; but there is good reason to believe that various narcotics were used for smoking-purposes previous to that time, as hemp and opium are used in the East to-day.

(2.) There were doubtless many slaves in Pompeii. Of the Romans we learn, that "during the latter times of the republic, and under the empire, the number of domestic slaves greatly increased; and in every family of importance there were separate slaves to attend to all the necessities of domestic life." *

(3.) Both the Greeks and Romans boiled the juice of the grape until it was thick enough to resist fermentation; and, indeed, the practice is still continued in Italy and France.

(4.) The sleeping-places of the Pompeiians were so small, and their beds so very unlike ours, that he might have seen them without recognizing their character. The rooms were frequently only large enough for the bed. Sometimes the bed was indicated by an elevation of the masonry, on which mattresses or sheep-skins were laid.

DYERS AT WORK.

Nov. 20, 1872.

Same specimen: —

Commenced to speak before it had reached his forehead.

* Smith's Dictionary of Greek and Roman Antiquities, art. "Servus."

"I am right in the business part of the city. There are a great many men pulling an immense stone. It is on wheels. There must be a thousand men pulling. It is so heavy, that it sinks stones into the ground as the wheels pass over them. The wheels are as much as five feet wide.

"I can see the place now where the stone is to be put. I think it is intended for a monument over a grave for some great person. I see several tombs here that are very beautifully fixed: they are square at the bottom. (I do not think I can see as fast with the specimen in my hand.") (Puts it to his forehead.)

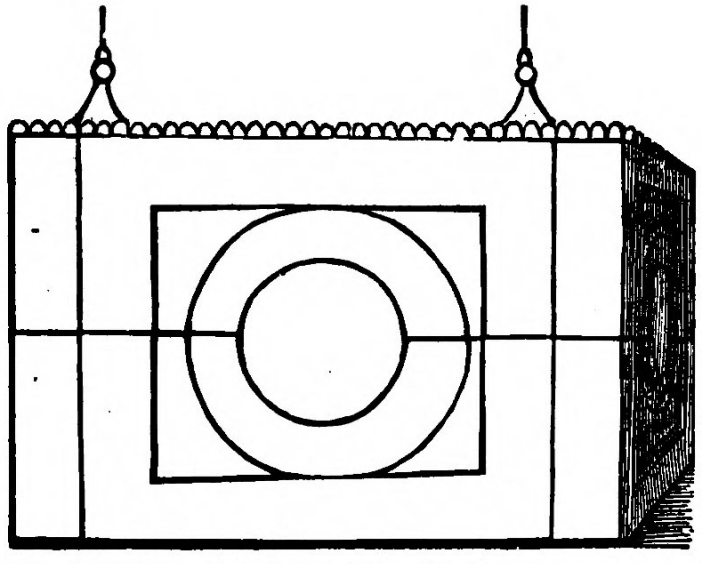


FIG. 13. — Tomb, Pompeii.

"I am not exactly in the same place now; but I can see it. Some of the people that I see now dress very queerly. They have sleeves and pants too long and too large for them." (Draws a tomb that he saw near where the stone was to be put. — Fig. 13.)

"I am at some place where I see cloth of different colors hanging out to dry. They are gay colors,— blue, yellow, green, red, and pink. I see long tanks with colors in. Some of the cloth has spangles in it in places,— something to make it glitter. Some of the cloth is differently colored on the same piece, and the colors blend into one another. I cannot imagine how they do that.

"I see an image of wood that is hollow; and men put pieces of paper into its mouth. They seem to be receipts. The paper seems coarse. Every man that carries off a bundle of cloth puts one in. The image sits in a chair, the bottom of which is a box, which can be opened to take the papers out.

"They write in a very singular way. They hold the black stick, clasped by the middle finger, on the back of the other fingers. The stick seems to be charcoal. There is paper at the top, so as not to black the fingers.

"After they dye the cloths, they beat them for some purpose. All the people in the place are busy.

"They have an immense quantity of cloth to dye: there are stacks of it. Most of it seems like flannel. Some of it looks like a gray army-blanket. Every thing goes along very quietly. I see cloth in the tanks."

("Where does the cloth come from?") "I do not know.

"The street looks well where this is. There is a good deal of business done here. They must be great fish-eaters, I see so much for sale. The fish are hung from the ceilings of the stores, tail down. They

sell them with strings on, so that a man can carry them home.

"The butchers hang their meat up, and take it down with a hook on a pole.

"They have some kinds of fowls that I do not know; but they are swimming-birds.

"The men wear gayer clothes than the women. They wear stained cloth, and some have feathers; while the women wear much more sober colors.

"I see what I think are soldiers now and then. They are dressed alike. They carry something like a sword, with a curved blade. They have a sheath for it."

POMPEIIAN FANCY STORE.

APRIL 22, 1873.

The specimen examined was a piece of Mosaic pavement from Pompeii.

"I see some very old-looking ruins. The place looks not quite so large as a city. Pillars are sticking up in different places, and some walls, and flat roofs on some of them (1).

"Now I seem to be in another place. I am in a shop, or store. I see some very beautiful slippers; but they are heavy, — made out of metal (2) that looks like copper. They look as if they had been worn. They are bright on the bottom, but green and dark above, corroded. There are figures of people on them all round. They are not very well done, — a good deal like the Egyptian style.

"I see a strange-looking hat, or something to wear on the head. The top is made of metal, and a great

deal of hair is stuck round it; so that, if the persons who wore them were bald, they would appear to have a good head of hair. There are pictures of animals all round it, — fanciful animals. A point stands up in front." After the examination, he said that he saw some women wearing hats of this kind.

"There are a great many vessels here made of earthenware, in the shape of water-fowl, with covers. The head is represented as bent back; and that forms the nob to lift the cover off with. (Draws Fig. 14.)

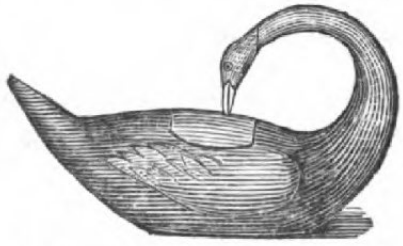


FIG. 14. — Earthenware vessel.

"This seems to be quite a fancy store. I see lots of dishes, like our old-fashioned dishes, with pictures; only the pictures are cut into the plates instead of being placed on them.

"I see a number of little square boxes placed together, so that they look almost like cells in honeycomb. Each has a handle; and there are fancy things inside of all of them. They are made of metal. (They seem to use a great deal of metal.) Every thing is wrapped in something like cotton; only it is yellow (3). There are little painted images in some that look like dolls. Each cover is labelled; for I see writing on them. In some I see what look like needles; but they have no eyes. They are made of

metal, and bent over into a loop at one end, so that the thread could be slipped in. The part bent over touches the body of the needle. They may not be needles; but they look like them.

"It seems quite warm here. They have the doors open.

"Every thing seems made to hold something with great economy. I see a toy dog; and, when its head is pulled off, there is a place in its body to put things in.

"I see some small earthenware jugs that look a good deal like some that we have now; only they are of a brick color. Some have handles. The floor of this store is all nicely marked with small semicircular figures in regular lines and circles.

"I see some people with veils on like aprons or long masks. They see through holes in them. I think the persons that wear them wait on the customers (4). They go round and lift off the lids to show what the inside of the vessels is like.

"I see a fanciful animal made of metal. Its mouth can be pushed open; and, when articles are put in, it holds them tight. There must be a spring inside.

"The people are very talkative: they are chatting away to one another. It seems as if they repeated a great deal. They talk very fast, but not very loud.

"The women have pants like Zouaves, — a good deal larger than the men. The dress is quite short, and seems almost like a jacket."

A WALK THROUGH THE STREETS.

"Oh! I see a quarrel between two women in the street. One woman took off a metal slipper, and threw

at the other. She is walking with one foot bare after the slipper. The other walks off. The rest of the people pay little attention to it. I guess it is a common thing.

"The streets are very narrow, — extremely narrow, — and alive with people. They are only to walk in. I see no horses nor carriages nor sidewalks; all paved. People are carrying things on poles, a man at each end.

"The signs are curious. Every store seems to have some animal for a sign, — some imaginary, and others real. One has a lion's fore-paws and head, and the rest is a lizard. Another is a dragon. Another has a cat's head and fore-paws, and hind-feet and quarters like a deer. I do not know what they are made of, — wood, I think; but they shine as if they were made of polished copper. One is a duck or goose, and a man astride of it, holding up a board, made to look like metal, with writing on it. The man has one of those veils or masks on. Every store has something of this kind. One has two snakes with heads looking in opposite directions. They have crests on. I see a handsome one now, — a warrior with a sword and shield. He has a fine-looking face. He looks like a picture I can show you in the dictionary (Mars). Another one is a man with a vase on his head, and writing on that (5). .

"I see people now, living on the top of flat-roofed buildings, cooking fish and other kinds of food. They hand them down to the street by ropes to their customers, and draw the money up. It seems as if they might cheat. A man below who wants any thing

shakes his hand; then those on top lower it down. Sometimes two or three try to get the same customer, and swing their dishes toward him. I can see some eating their meals as they go along the street. Several persons are in the business on the same roof. The houses are so near, I can see people jump from one to another.

"They cook very curiously. It is not very far down; and they have a fire below in some places. The heat comes up through what look like small chimneys; and they do their cooking on the top of them. In other places there are brick fireplaces, where the cooking is done.

"I can see a long way from the tops of some of these houses. There is a river not a great way off. I think I have seen it before.

"I see people in the streets wearing those metal caps with hair round. They look quite well. I should think those metal slippers would hurt the people's feet.

"I see a different kind of head-covering now. A man is selling them in the street. He has a pile on his head, — one on the top of another. They are skull-caps. Some wear the metal ones on the top of them. I saw a man take his metal one off, throw his old one away, and put the new one on. I see a fellow try one on that is too big for him. It comes down over his ears.

"I see another sign: it is a windmill; and on every sail is a fish, that seems to be swimming round after the others. It is over the door of a fish-shop."

(1.) This I could not at first understand; but, look-

ing over some stereoscopic views of Pompeii, I saw walls with roofs over them, evidently to protect them from the weather.

(2.) I cannot learn that metallic shoes or slippers were ever worn by the Romans.

(3.) Probably silk.

(4.) These may have been negro slaves, whose faces their employers did not wish to have seen. In a subsequent examination he refers to this again.

(5.) Some of these signs have come down to our own time. Fig. 15 is the sign of a wine-shop, — two



FIG. 15. — Men carrying an amphora.

men carrying an amphora, in which wine was generally placed. Fig. 16 is the sign of a milk-shop; goats at that time probably supplying most of the milk. Both these are from Dyer's "Pompeii."

POMPEII AS IT IS.

APRIL 12, 1873.

Same specimen : —

"I see old ruins with this. It looks a good deal like a burnt place, where old chimneys and walls stand up. I do not see any thing of much account

here: it looks desolate. There are great heaps of rubbish; and I see those roofings to walls that I saw the other day.

"Quite a way off I see a lot of mules dragging off dirt, and some men shovelling it up.

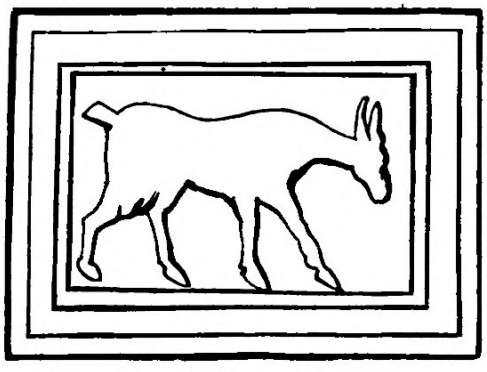


FIG. 16. — Sign over a milk-shop.

"I see one man that looks as if he might be wealthy: he is walking about, picking up things. He has some costly articles that look like gold. He has a small vase made of metal, like a tall drinking-glass. It is quite thick, — a quarter of an inch thick, I think. It is rounded inside at the bottom, like an egg-cup. It is so bright, that I can see the light reflected inside. This man wears a kind of cape. They sift the rubbish before they put it into the carts. They have a heap of relics here.

"I see the legs of a bronze image: there are holes above the knee. Now I see the rest of it: it is made to fit in. It is about a foot high, — a man with sword and armor."

When this examination was made, he knew, of course, where the specimen was from, and, from engravings which he had seen, may have been in-

formed with regard to most of what he saw. I do not think, however, that his knowledge influenced his psychometric vision.

POMPEIIAN FISHERS AND POTTERS AT WORK.

April 23, 1873.

In the morning I gave him the piece of mosaic from Pompeii. In about a minute he said, "I cannot see plain at all." I then presented him with a fragment from the top of a Corinthian column; also from Pompeii. He said, —

"I seem to be in a stone quarry. It must be near this time; for I see men with iron tools, — hammers and chisels. They are cutting some very pretty things out of the blocks.

"I am on a bridge now. (I cannot see well at all.")

In the afternoon I tried him with the specimen of mosaic again. Immediately he said, "I saw before I got it to my forehead.

"I am on the bank of a river; and I see some nets. I do not know whether it is the same place that I was at before or not.

"I see some people fishing in a boat now: it is a very queer boat indeed. (Draws Fig. 17.) It looks as much like a bath-tub as any thing I know of. They have a net that is round, — large at one end, and gradually diminishing to the other. It is kept open by hoops. There is a bag at the end; and that is just full of fish, and they are queer fish too. They untie the bag, and the fish come right out. Many of the fish are like eels, and crawl round the boat like snakes; and the men are hitting them.

"These men have many nets in the river, and they keep going from one to another. They have some kind of bait fixed in the net to entice the fish in. It is tied on all along, but most at the end. The men keep jabbering to one another all the time.

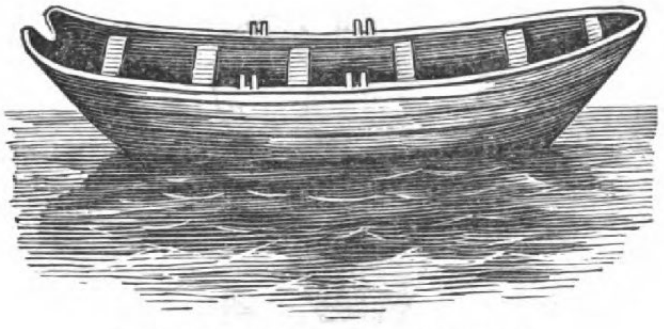


FIG. 17. — Ancient Pompeiian boat.

"I can see the town now where they live. There are a great many small wharves built out, and a great many boats here of different kinds; but they have considerable resemblance to each other.

"They are building a wharf here. There are a lot of men at work: they have got the posts down, and are putting on the boards.

"At another place I see them getting clay out to make brick, I think. Oh! I see them making fancy things out of the clay. Most of them are vases. They have moulds, and press the clay in, and then stick the two hollows together, and thus make a lot alike." ("What are the moulds made of?") "All that I see are of wood.

"They are baking some of them in a fire. They are very careful of them. I see a pretty one that I will draw. I see as many as two hundred like it in the

fire. (Draws Fig. 18.) It is marked with hollows all around it."

In answer to questions, he said the fire was large, like a bush-fire; and men kept throwing on pieces of wood as it burned down.



FIG. 18. — Ancient Pompeiian vase.

"They have persons to pound the clay up fine. It is a whitish clay before it is baked: in the water it looks a little bluish.

"I see one very nice mould: it would make splendid vases; but I do not see any of that kind.

"They lay the vessels on top of the fire, and a man turns them over very carefully.

"They beat the clay with large stones. The stone is such a shape, that one end serves for a rude handle. (Draws Fig. 19.)

"I see them paint the vessels after they get them out of the fire. (All the workmen seem to be in company.) On some I see fish painted, that have a long nose like that of a sword-fish. The scales are made by lines that cross. Many of them are painted with notches all round like the teeth of a saw. Some of them are three feet high; and all appear to be for use.

"After they are baked, they are dirty; and they wash them off in the river. It is a busy kind of place here. Some of the fellows are half naked, and wade round. Some get heated attending to the fire, and run in to cool off.

" Some of these pots break easily. I saw one man lift one up with a stick: it was not baked enough to hold, and it broke.

" After they come out, there are rough places on them; and they rub them with stones to smooth them.

" They make stars on some of them by several impressions of the back of the thumb and nail; and they have bronze stamps to mark them with.



FIG. 19. — Stone for pounding clay.

" They are very ingenious in joining the two sides together. They take a piece of clay, and paste both edges over, and wet them, and then place them together.

" I see some cylindrical vessels about two feet long, and six inches across.

" I see more bronze tools, — small gouges for making ornaments. They have a very cheap way to make ornaments. Wires are bent into waves; and they press them against the clay round the pots, and make wavy lines.

"I have been walking along the river-bank; and I should think there are as many as four hundred men at work. There is a great cloud of smoke from their fires. There are several companies. Some have much better tools than others, and make better articles. I see what look like molasses jugs; but there are handles on both sides.

"I see them making a jug with one handle now. They cut off the half-handle when they take it out of the mould, turn it over, and put it on the other side.

"Men are carrying the vessels off to town, I think. This place is a little way out.

"I am in town now, and see a store where they keep some kind of drink. A good many men are drinking there. They look like rich persons. They hand the liquor round in small vases.

"Near there I see them making moulds. They have a bronze fish, and heat it, and burn it into the wood till it takes the image of the fish. They scrape and fix it after it is done.

"I see pens made of clay, in which a man keeps animals that look like rats. They are near his house. They are full of small holes. The rats are tame. The man throws food down on top, and they come out and carry it in. They are ravenous: they jump to catch it out of his hand. He takes them up, and strokes them.

"Black and dark-brown colors were used for painting the vessels."

I think this must have been before the historical period. The shape and general appearance of the fishing-boat, the primitive method of baking the

earthenware and making moulds, — all suggest an earlier period in the history of Pompeii than books give us any account of. I think the number of potters stated by him is probably greatly exaggerated.

POMPEIIAN BRONZE-WORKER.

APRIL 24, 1873.

The specimen examined was a bronze statuette from Pompeii.

"I see a man at work in a place that looks like a blacksmith's shop, finishing a large ring about a foot in diameter. It is metal, — bronze, I think. He is filing it. They have some very good files. They cut the metal very easily. The ring is ornamented with round spots, and has a hinge at the back, so that it can be opened. He has a great many tools of different sizes. The files are short and broad, and fixed to handles of wood. He has a fire here, and has metal melting. He is going to cast; for I see moulds. In one place there is a stone mould.

"This seems to be from the same city; for I see the river again, but no pottery-making; and the city seems better built than it was then.

"The metal is melted in an earthen pot in a small square furnace. He seems to be making nothing but weapons, — long-pointed knives, resembling swords and spears.

"He is pouring into the moulds now. I should think he would spoil his moulds. He dips them into water after he pours the metal in. The weapons look pretty — almost like gold — when they come out. There is a kind of edge where the two stone moulds

come together; and he is breaking that off. I see one that did not have enough metal poured in; and that is spoiled. He is a very old man; but he is as interested as if it were a new business.

"He does cast other things; for I see the cast of a man, something like this, only larger; and there is nothing in his hand.

"This man is going to dinner now. There is a house near, and table set. What a quantity of weapons he has hanging all about his rooms! — mostly swords and knives, and some long spears with wooden handles.

"They did not believe in making high rooms then: they do not seem to be more than six feet high. They do have curious dishes. I must draw some of them. Every one at the table has a cup like this. (Draws Fig. 20). The plates are much like ours; but



FIG. 20. — Pompeiian drinking-cup.

they are two or three inches deep. They are nicely glazed. Here are saucers too. Their knives look more like dirks or small-swords. (This man seems to be quite rich.) They hold the food with the left hand, and cut with the right.

"There are maps in relief on the walls. They

represent the country round, — rivers, mountains, and such like. The rivers are painted blue. I see houses cut on it too. I think it is this neighborhood.

"This man is the oldest one at the table. A woman that I take to be his wife seems nearly as old. There are several at the table: I think they must be his children. They are all dressed nearly alike. It seems almost like this time. I can hardly believe this to be very ancient. They wear cloth, good cloth, and nicely colored. I do not think they believed in shaving. They eat a great deal of vegetable food. I see oranges on the table in a very handsome dish, with open-work all round, so that one can see the fruit (1). I see something like pickles. They taste like them too. They are like pickled cucumbers.

"They make a great deal of clatter, there are so many of them. The old man and the boys have a kind of decoration on the breast: it is a round plate of silver, with a head on it.

"In one corner of the room is a large white statue made of plaster or marble. It represents a man with one hand up to the side of his head, and the other by his side. His face is wrinkled, as if by deep thought. It looks very natural.

"They certainly know how to stuff animals; for behind it is a stuffed cat very much like a Maltese cat; but I think it is a wild one. It is nicely done, but has no eyes.

"Over the table is a kind of scuttle, where they let the food down, and take the dishes up to be refilled or cleaned (2).

"They have a square furnace for cooking, something

like that I saw the man melting the metal in. They have a great abundance of fruit up here, — boxes and boxes of oranges and other fruits. I see corn too. It looks a good deal like Indian corn. It is yellow." ("Are you sure it is corn?") "Yes: I am sure it is corn, a little smaller than our common corn (3).

"They seem to use elevators a good deal. A man came with fish; and they put an elevator out of the window, and lifted the fish up. The window is only a blind that they open and shut" (4).

(1.) Oranges, we are told, were unknown to the ancient Greeks and Romans; and it is said, by various authorities, that they were not introduced into Italy till the fourteenth century: but this is, I think, a mistake. It is not at all likely that the Romans, who ransacked the world for what could add to their enjoyment, should have allowed this delicious fruit to escape them, which certainly existed in Southern Asia and Eastern Africa from the earliest historical times. The orange is grown, at the present time, in the vicinity of Naples.

Since writing the above, I have found the following note in Marsh's "Nature:" —

"A correspondent of 'The Athenæum,' in describing the newly-excavated village, which has been named Livia's Villa, near the Porta del Popolo at Rome, states that 'the walls of one of the rooms are, singularly enough, decorated with landscape-paintings, a grove of palm and *orange* trees, with fruits and birds on the branches: the colors all as fresh and lively as if painted yesterday.'" — *Athenæum*, No. 1859.

It seems highly probable that these "golden apples" gratified the palate of the ancient Roman no less than his modern representative.

(2.) According to this, the kitchen was on the second floor: it would not, therefore, be difficult for the heat from the fire to be used on the flat roof, as Sherman saw done on April 22.

(3.) It is generally supposed that Indian corn is a native of America, and that it was unknown to the ancients; "but a representation of the plant found in an ancient Chinese book in the Royal Library in Paris, and the alleged discovery of some grains of it in the cellars of ancient houses in Athens, have led some to suppose that it is a native also of the East, and has, from a very early period, been cultivated there." *

(4.) At a time when window-glass was almost, if not entirely, unknown, such windows must have been very common.

A THEATRICAL PERFORMANCE IN POMPEII.

April 25, 1873.

The specimen examined was a bronze lamp from Pompeii.

"I see some very low houses, — a city with the house-tops flat, and all of the same level. To look across it seems like a great plain. The streets are so narrow, that they do not show much. It is pleasant and warm here. The houses are about twenty feet high; but they vary according to the ground, so as to make them level on top (1).

* Chambers's Encylopædia, art. "Maize."

"I see some strange-looking people through a window. They look like actors in a theatre. Ribbons

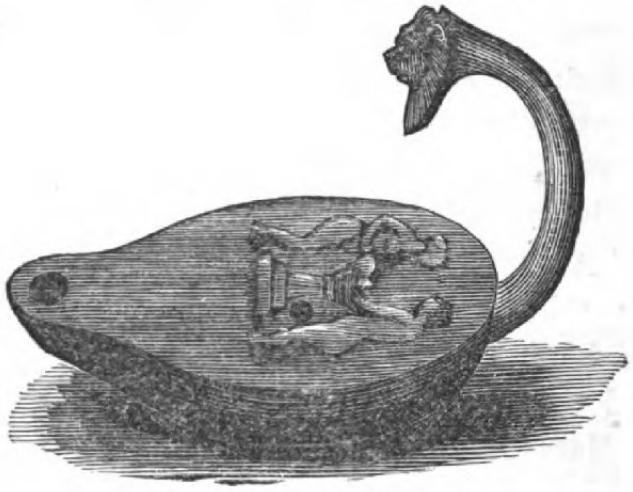


FIG. 21. — A Pompeiian lamp.

hang down from a belt round them. They are dancing. I can see an audience now looking at them.

"The place is in the shape of a horse-shoe, and like an amphitheatre; the seats at the back being higher, so that persons can look over. It is very bright here. They have doors to open above for light and air, so that it makes it very light (2). I see some girls dancing on the very ends of their toes. They are on a kind of stage, and this is a sort of theatre.

"They have stopped dancing. Now there are two men in armor fighting with swords. They strike terrific blows; but they don't hurt. One struck; and the other seized his sword with his left hand, and with the other hand struck him over and over. The crowd laughed then.

"They have put their swords down now, and they seem to be wrestling. They have taken some of their

armor off. No: it is a gymnastic performance. One jumped on the other's shoulders. He jumped up, turned round, and came down on his shoulder again. He has jumped on his head now. The other one holds up his hands: he stands on them; and then the other spreads them apart till he sits on his head. When they get through, they go into a room on one side of the stage to change their clothing.

"Now two come out with armor up to the knees. It consists of narrow strips up the leg, like splints. This is a sort of kicking-match. They kick sideways, and try to knock each other down that way. They do not touch with their hands. They are very strong.

"Here is a sort of clown coming out with a pointed hat on: he looks just like a clown in a circus. He has no hair on his face; but he is painted as if he had a beard. He keeps talking all the time. He has got hold of the two men now, and put their heads together, and is pretending to squeeze them. One is going limping off. The clown went behind him, and tripped him up. Before he could look round, the clown had turned round, and was innocently talking to the fellow behind him. He has come back now; and the clown slaps this fellow on the face, and turns back to him. They are both after the clown now, and he runs into that room. It looks very much like a circus.

"There are two more men now dressed in dark-colored tights. They look very strange. They are going through a number of performances. One lay out straight, and held his feet together; and the other lifted up his feet, and he gave a spring, and turned a somerset, and landed on his feet. When they do such

things, servants lay a rug on the floor, so that they may not be hurt. They do many such tricks as I have seen in a common circus.

"They have ropes to the ceiling; and these two are on them now, — something like a trapeze. They are first-rate performers. I saw one swing from one trapeze to another with his hands, — a great distance. He caught it, whirled over, and caught the first with his feet; he then let go of the second, and swung back on to the first. That was well done!

"Those two have gone in. Now a man comes in, dressed up like an old man, with a false face on (3). He is saying something funny; for they are laughing. He takes up a large piece of wood, and puts it to his false mouth, which is made to stretch; and he looks as if he swallowed it. How they laugh! He seems to wrinkle his face. Now he pretends to have the stomach-ache, and heaves; and out comes the wood on to the floor. You would laugh if you could see it as I do. He is going to eat a knife now, but cuts his mouth away back almost to his ear. It is done by an opening that was there before, and was partly concealed by his beard. He has fallen to the floor, and is, I think, pretending to be dead.

"Now another man comes in as a wolf with enormous teeth. He comes and looks at the man; and he opens his eyes, and jumps up; seizes his knife, and cuts the other's tail off, piece by piece. He howls dreadfully, and runs back into the dressing-room again: the other follows after, picking up the pieces of the tail as he goes.

"A handsomely-dressed fellow comes out now.

Two assistants hold up a rope for him to jump over. It is as high as his head; but he jumps over it easily, and turns a somerset over it when he jumps.

"The assistants have been fixing a rope, which is tightened by a crank. He is going to walk on it. He jumps on it, and walks on it just as if he were on the ground, and talks to the people.

"A little boy about seven years of age came out. He lifts him from the ground, holds him on his hand, and walks along, talking to him. The little fellow gets down and walks along the rope, and they talk to each other. The little one takes out a knife, and pretends to stick it into the man. He pretends to be killed, and falls off the rope on to the floor, with his back to the audience. Then a scuttle opens under him. His dress opens; and he crawls out like a butterfly out of a chrysalis, and leaves his dress behind, that looks just as it did before. The little fellow gets down, and pretends to cut him up; but, finding he cannot do that, he lifts him up, and shoulders him, so that his legs are on each side of his neck. He looks as if he was very strong. As soon as he gets into the room, the other one comes walking up stairs as good as ever. That is a big trick (4).

"The audience is moving now: there are thousands of them."

At the close of the examination, he stated that women were present; but, as he did not notice them particularly till the audience was dispersing, he could not tell whether they sat by themselves or not. No curtain fell between the various performances: when one was over, the next commenced.

(1.) This is a strange story; and I think he must be mistaken about the houses varying to suit the inequalities of the ground. That there may have been a law to restrict the height of buildings is probable. In Rome, "to guard against danger from the extreme height of houses, Augustus restricted the height of all new houses which were built by the side of the public roads to seventy feet." * Nero also restricted the height of Roman houses after the city was burned by the Gauls.

(2.) Pompeii had two theatres, — a large one that held about five thousand spectators, and a small one that could accommodate about fifteen hundred. The large one was not roofed, but covered with an awning to protect the audience from the weather: but the small one, from two inscriptions found in it, is known to have had a wooden roof; and this, I think, was the one in which he saw the performance. Fig. 22 is a representation of this little theatre as it now is. The general horse-shoe shape is seen in this engraving, and the raised seats, that allowed the spectators to see the performance over the heads of those in front.

(3.) Fig. 23 — from a painting at Pompeii, representing a comic scene at the theatre — shows a "false face," or mask, worn by actors on the Roman stage.

(4.) With but little exception, this seems very modern, — a mixture of farce and circus performance, just suited to the taste of the masses then, as it is, indeed, to-day. Such a performance in Boston now would draw a larger crowd than the best tragedy. Referring to a performance in this very theatre, Mon-

* Dictionary of Greek and Roman Antiquities, art. "House."

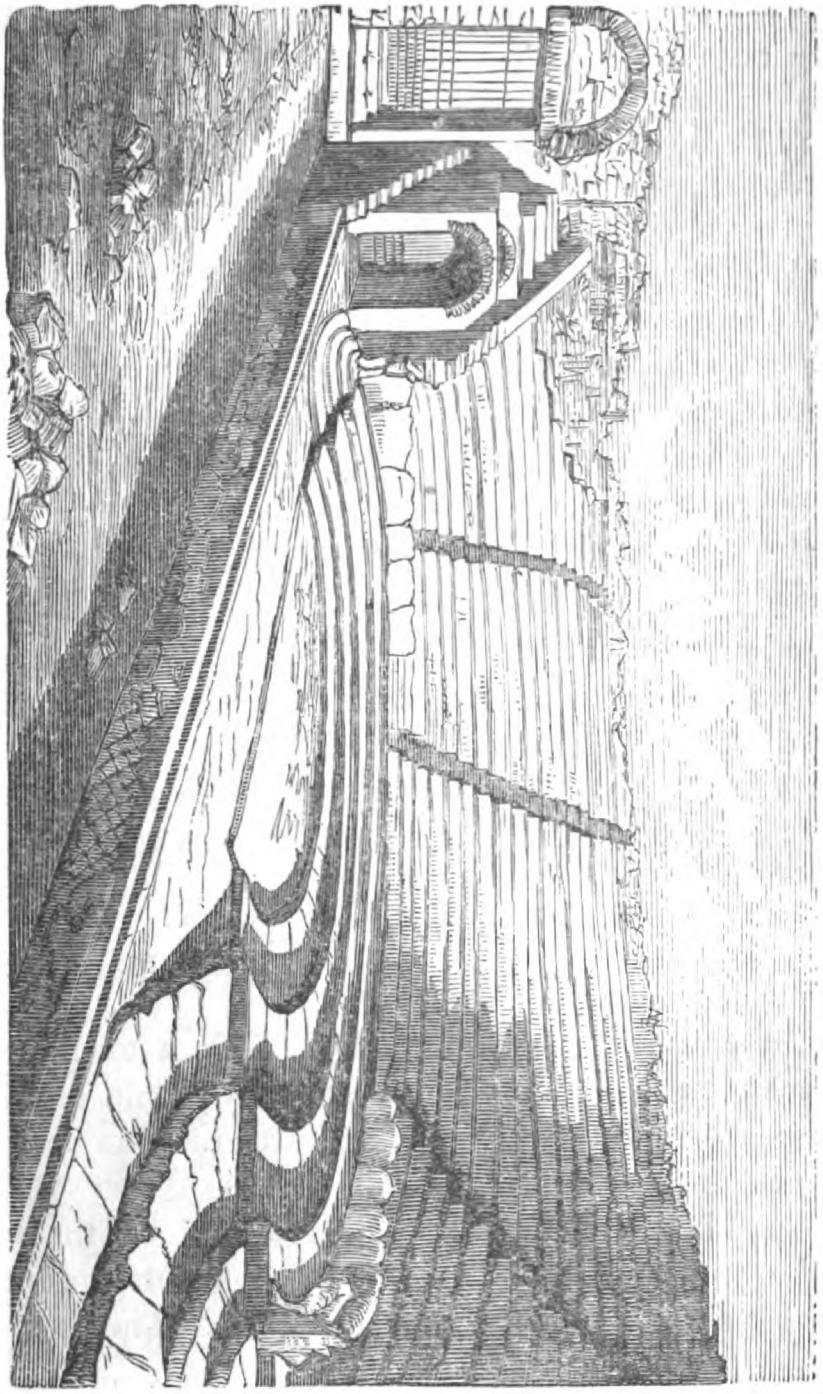


FIG. 22. — Little theatre at Pompeii.

nier says, "Call into the odeon the rope-dancers, the acrobats, the jugglers, the ventriloquists; for all



FIG. 23. — A comic actor.

these lower orders of public performers existed among the ancients, and swarmed in the Pompeiian pictures." *

"The art of dancing on the tight-rope was carried to as great perfection among the Romans as it is with us." †

A FIRE IN POMPEII.

MAY 9, 1873.

Same specimen: —

"I see some place all in flames. It is a town that I have been to before. I can see the people on the house-tops — where they are not burned. The houses do not burn very readily. There is a very black smoke rising from the fire. Some stand on the top of the roofs, and pull up water in buckets, and do nothing else: others throw it on the fire. The theatre

* Wonders of Pompeii, p. 213.

† Smith's Dictionary of Greek and Roman Antiquities, p. 454.

I saw is on fire on top. They are throwing water on it all round; and some are inside, throwing from the top of the seats. Some men are going up to the fire with the armor on that they use in the plays.

"I see some kind of a machine now for throwing water; but it is very feeble. The water spreads out like a fan: it is made so on purpose. The machine is a long box, and has movable sides inside pushed together by handles; and that drives the water out.

"The top of the theatre has fallen in now; but it does not burn very fast. There was not a great deal to burn. There are a great number of men round here with buckets. The houses burn slowly, so that they save their goods. About a quarter of the place seems to have burned; and, near the edge of the fire, men are on the house-tops like an army.

"In one place they are throwing sand on to the fire. It sems to do fully as well as water. Men are coming up with bags of sand on their backs, which they scatter round. I see them lay down planks to go across narrow streets to where the fire is. One bag of sand will cover a space as large as this floor.

"I think the fire was nearly over before I got there. I think they might use sand now: it does not injure things; and the fire cannot break out again after it has been covered with it. It acts first-rate.

"I see a tank up high, from which they have a hose, and play upon the fire; but they have to carry the water up to pour into it. It is on a scaffolding, and is the highest thing I see.

"There are very few people in the streets: they

are all on the tops of the houses. I suppose they are afraid they will get wet, or have sand poured on them.

"Part of the roof of the theatre fell on the dressing-room. Men and boys are round near there with the actors' dresses on. There is a pile of things in there. Some hang on pins against the wall. One part of the room is divided from the rest; and that is full of masks of various kinds inside of one another. Many of them have large mouths (1). I see an enormous hat, pointed like a clown's, about ten feet long, and six or seven feet in diameter.

"I guess the owners are coming; for those fellows are undressing as lively as can be, and putting down their swords. A man is coming in now with a large sword: he must be a soldier. He looks fierce. One of them that had something in his hand dropped it. (I see a picture on a curtain in this room of this same city on fire; and a crowd is represented on the buildings.) The soldier is talking to them, and shaking his sword at them. They are all clearing out, and he has not touched them. The place looks very singular now. The fire is out here.

"I see them lower a man down with a rope, in a loop of which he sits; and they hand him buckets of water down. The buckets are all angular, six or eight sided; and some leak almost like riddles. There is a child asleep in the room where the man was throwing water. He woke it up, and it went downstairs.

"They have handsome mantle-pieces here, with ornaments on them."

(1.) Fig. 24 represents various masks, paintings of which have been found in Pompeii and Herculaneum.



FIG. 24. — Masks found in Pompeii and Herculaneum.

A POMPEIIAN EATING-HOUSE.

MAY 15, 1873.

Same specimen : —

" I seem to be in a store, — a place where they keep boxes from two inches square to three feet square. Some of them may be used for trunks. There are handles on them, and they are nicely lined. Every large one is rounded at the corners. By stopping up the corners, they make the inside circular.

" They sell gum here — something to chew — in small boxes. It is like spruce-gum. It is pink, and put up in sticks like candy.

" The ceiling is low ; and there are hooks to hang boxes on at the back of the store, and a room where they are making them. I see a man at work. Back of this, there is a door that opens into another street.

" These are flat-roofed houses ; but they are not level. Some are high, and others low.

" I see a good many people in the streets. They carry things on their heads a good deal. I see those signs in front of the stores. In front of this, a man

is standing, holding out a box. It is made of wood, and, I think, bronzed. I can see one place where it has worn off.

"The sign of an eating-house is a man with a plate and an immense spoon: he is ready to take a mouthful." ("Look in there.")

"They talk a great deal when they eat. A soldier is in here, with a sword by his side. It touches the floor when he sits down. (Draws Fig. 25.) It is in a scabbard, which is curved, and hung by a belt.

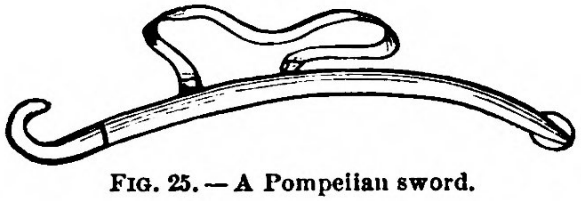


FIG. 25. — A Pompeiian sword.

"A fellow is in here trying to make a fool of himself. He looks like a 'horrible.' His face is blacked; for, when his sleeve is pulled up, the skin is white. The soldier is very much pleased about something: he is slapping his hands, and shaking his finger. The blacked man goes round and waits on them, and makes them laugh.

"They have food like boiled wheat, and something sweet, like molasses, that they put on it."

("How do they sit?") "At long tables. The place is long. There are women for waiting, but none eating. They are dressed oddly, — with short dresses and wide pantaloons."

("Where is the cooking done?") "In an L, on one side.

"Where the ceiling joins the wall, there are paint-

ings all along, — part on the wall, and part on the ceiling. There are paintings all along this room, a few feet above the floor: they are of a bronze color on a buff-colored wall.

"The ceiling has the most figures; men and dragons, — men killing animals like dragons with spears."

STONE-YARD IN POMPEII.

MAY 16, 1873.

The specimen examined was the fragment of a Corinthian column tried on April 23.

"I see exactly what I saw before with this, — a stone-yard. Men are cutting stone. They have chisels that are pointed like a pick, which they rub on a stone to sharpen.

"One man has large ear-rings nearly black; but they shine.

"I see some large walls that they are building, two feet thick, and sixteen feet high. The top stones are decorated, and are made to extend over.

"Inside I see cut on a stone a representation of a man with a spear ready to plunge into a horse, and on another a representation of a bull-fight: a man has hold of the bull's horns, and is away up in the air.

"An old man is walking round with an old black cloak on: his beard is long and white. He seems to be the master here. He looks the very picture of some old Jew.

"I see now, cut a little way into the stone, a number of men going up a mountain; and, on another one near it, a number falling down.

"I keep moving on through the place. They make a great racket at the stone-yard, — 'Click, click, click.'

"Here is the statue of a man cut out of marble, on a pedestal, with several arrows stuck in him. He seems just ready to fall. It is in the open air. There are not many houses here: they are farther down.

"I see now a statue three times the size of a common man, made out of brick; but it does not look well."

THE DESTRUCTION OF POMPEII.

MAY 17, 1873.

I was desirous of having him see a performance in the amphitheatre, and requested him to look for that. The specimen examined was the lamp (Fig. 21) previously used; but he was unable to find the place. What did come up was entirely unexpected. He knew, of course, that the specimen was from Pompeii.

"I see a lady sitting in a room, sewing. I see how they sew with that needle I saw the other day. They draw it up to the head, and then push; and that opens the cloth sufficient to allow the needle to slip through.

"The room she sits in is low; and at the back part is a picture of a lady, handing what looks like a book to a boy. This lady is making a dress. It is warm here, and the windows are open. It is not in the city, but near the edge of it.

"There is something that goes round the room near the bottom, that looks like a mop-board; and on it there are figures of people eating. A couple of

men come into an eating-house; then they sit down; next they are eating and drinking: they quarrel, and one hits the other with a chair; and then they are put out. They are colored. One has a red jacket and black pants; and another, white jacket and black pants. The people at the tables, and the waiters, are represented as looking at them. They are not more than twelve inches high. It seems to be paper pasted on the wall. The picture at the end of the room is painted on the wall, — brown on white.

"The lady got up and walked into another room, where there is a boy playing with a toy that has wheels, and an old woman on a bed, who seems to be asleep, and may be sick.

"On the old woman's bed is a small roll of pictures like those around the other room: she has been looking at them. They are country scenes, and are better made than the other. It looks like one of those children's panoramas. A man has a small cart full of melons: another man jumps in to ride; and the first one kicks him out. After that, he seems to be hurt in his eye; and then it is represented as swelling till his head is all one large eye.

"I see some pictures in frames hanging up in this room. One represents a man talking to a large crowd: he is standing on some boxes, and wears a very broad-brimmed hat.

"I was looking at this picture; and, quick as lightning, it turned to night; and I am not in the same place. I am in the street. It is a time like the 4th of July. I see fire-works. There is a revolving light made by what look like lamps from the centre of a

wheel to the circumference (the wheel is about ten feet in diameter). As it turns, it makes a number of fiery circles, one inside the other. The largest light is at the centre. It is worked by a rope from a large wheel turned by hand.

"It has changed again. I am where there are many holes in the ground, and smoke and steam are coming out. There is quite a hissing noise like steam out of a pipe; and small gravel-stones fall down from the vapor-cloud that rises from the hole. When the wind blows the steam and smoke to one side, I can see fire down the holes. I hear a good many explosions like the sound of fire-crackers. Dirt flies up from the hole every time there is an explosion, — sometimes twenty feet high (1).

"This is an elevation, but not very high. I hardly think it can be Vesuvius (2). It must be near Pompeii; for I see the flat-topped houses.

"The smoke is unusual; for I can see the people looking at it from the tops of the houses. It looks much worse from the city than when I was there. It is toward evening. The smoke goes up, and spreads out till it looks like a stratus-cloud. It swells above the mountain, and spreads a long way.

"Those dirt-balls become more numerous; and before they rise there is a rumbling sound, till they are driven out with an explosion.

"Now it looks from here (3) as if the cloud were a sheet of flame by the reflection of fire from the holes. I see no smoke in the shape of a pine-tree, as I have read about (4). It is growing dark very fast; more by the cloud than the sun's setting. The people

are getting alarmed. I can see them packing up, and preparing to start off.

"Now there are slight shakings of the ground. The land trembles as if there were a great bog underneath, and some power shaking it. They are terribly alarmed now, and are running and hallooing. The streets are full of people. I see crowds with bundles on their backs.

"The volcano looks now like an immense fire: but it is not steady; it flashes up, and then sinks down. When the flame slackens, I can see the smoke coming out in dense clouds.

"Now I can see a very strong light on the highest part of the mountain, as if the lava had risen in the crater to the top: it lights up the city, so that I can see the people's shadows. They seem unwilling to leave the city till they are compelled. They do not know where to go, nor what to do.

"The light gets larger, and seems to spread. There is a fearful wind rising. The light from the mountain looks as large now as the sun when it first rises. I can see the figures and inscriptions above the doors, it is so light.

"Now the volcano looks like a fountain of fire. It is sending up red-hot stones. They seem very light. I can see them sail away off to one side, and still red. The wind blows exactly from the volcano to the city (5). The people are very much excited, and are running. I see two men running with a trunk tied to two poles.

"The cloud has now come clear over the city: there is only one light streak of daylight to be seen on the horizon on the other side.

"The cinders are falling now quite fast. They are very light; for, as they fall, the wind rolls them along the street.

"The volcano is grand. The lava inside the crater remains just so high.

"I see on some houses a parapet; and the corners are full of cinders, just like snow when it is drifted. Snow packs; but these don't sink: all count.

"I see one old man going along swinging a bag to keep the cinders off, and puffing as he goes.

"Now I can see lava that has burst out. Where it is running over, it looks like the lip to a pitcher. It is very bright here; and the cloud reflects the light to the earth, so that it is as plain as day (6).

"I see a store where melons were hung out; and some fellows on the road cut them off, and carried them along, eating as they went. The cinders are very porous: they are cool enough outside to handle when you can see them red inside. I can hear the volcano louder and louder, and the explosions are more frequent. I can see it flash up, but do not hear the explosion till the next flash comes, the sound travels so slowly. It flames up every time, I should think, for two hundred feet; and great red rocks are falling.

"The ocean is completely covered with the cinders. I do not suppose that a row-boat could be pushed through it. The earthquake-shocks are very numerous. I can hear a crash in the city every time there is a shock, like falling buildings. When the volcano is quiet for a moment, I can see lightning shooting in every direction. I have read of that; but I never saw it before.

"The shower of cinders is getting so thick, it is hard to see the volcano except when the cloud lifts up. The cinders are as thick as snow-flakes in a bad storm; some of them as large as my fist. The wind is strong.

"The city is on fire now. The people are trudging through the cinders knee-deep in places. They catch in every depression like snow-flakes.

"The lava-stream is long: I can see it like a river; but it is very crooked. I cannot see it along the whole course: it seems to be hid in ravines between hills.

"Without thinking about it, I was at the lava. This is a great sight! It runs about like molasses. It is so hot, that the top of a tree about twenty feet high, that bent over, took fire when the lava came under it.

"There are houses right here, and it pours over some of them. It came swiftly against one house, and took it right off quite easy. The stream is within a quarter of a mile of the sea, and it is about two or three hundred yards broad. It runs to the right of the city, and flows to the sea.

"It runs from this steep place very fast. It merely touched a rock, and the heat cracked it all to pieces."

("Go to the city.") "It is all in flames. The ashes are above the signs on the doors, where they are not on fire. The rain is coming now: it is pouring down. When the cinders strike a wet place, I can hear them hiss; but the lava cares for nothing.

"The lava is within forty feet of the sea now. There are great snapping noises in front as it moves

along. I do not know what makes them. I am preparing for a grand sight.

"It is within four feet now, and the waves are dashing on it.

"The lava runs out, and pushes the water back; or the water just leaves it. I can see the lower part now red under the water, — just as red as can be. Immense bubbles come up; and now the water is in a complete boil (7).

"When the lava ran under the water, it left a scum, that floats on top. The channel seems to choke up by the lava hardening into rock; and then it bursts out, and runs over the hardened lava. In that way it thickens up.

"The steam out of the sea condenses in torrents of rain, almost sheets of water. I see water flowing round in depressions of the lava, like drops on a hot stone.

"Great streams of water are flowing down the surface of the lava, caused by the rain.

"The ocean has left the land now for a space of about a quarter of a mile, and the lava is pouring on; but I see the ocean running in at another place where the land is sinking.

"Well, I declare! I see a man running round here between the sinking ground and the lava. Every thing is on fire around him. He seems to be crazy. There is no escape for him. He runs into the woods that are on fire. The lava makes it light for a mile, in spite of cinders and smoke and rain.

"I see the city. Poor city! it seems to have got nearly all the ashes. You can step from the ashes on

to the houses. The city would have been burned up if it had not been for the rain and the ashes. The ashes absorb the rain. The ocean is nearer Pompeii now. It looks as if the ground had sunk.

"I can see a white cloud over the spot where the lava has run into the sea. The current of wind seems to have carried all the cinders on to Pompeii. I think five minutes would fill a pint-measure. I cannot see a soul here. It is night; but the volcano makes it light.

"I see spurts of lava rise above the top of the mountain every few minutes. Sometimes the lava falls on the side of the mountain."

(1.) He seems to have gone to the crater of Vesuvius. The attention of the whole city must have been so directed to the volcano, that it is not surprising that his attention should be; but why not in all the previous examinations?

(2.) It is probable that Vesuvius was not as high at that time. Its height has been repeatedly changed by eruptions.

(3.) He had returned to the city, and was viewing it from that point.

(4.) The younger Pliny, who was looking at the spectacle from a distance of about six miles, says, "The cloud resembled a pine-tree; for it shot up a great height in the form of a trunk, which extended itself at the top into a sort of branches, occasioned, I imagine, either by a sudden gust of air that impelled it, the force of which decreased as it advanced upwards; or the cloud itself, being pressed back again by its own weight, expanded in this manner. It appeared

sometimes bright, and sometimes dark and spotted, as it was more or less impregnated with earth and cinders." *

(5.) In Pliny's description of the eruption, he tells us that the wind was favorable for carrying his uncle from the foot of Vesuvius to Stabiæ.† It was, therefore, favorable for blowing the ashes over Pompeii, which lay in the same direction from the mountain.

(6.) It is generally supposed that no lava flowed from Vesuvius during this eruption; but the reason for the supposition seems to be that Pliny is silent in reference to any lava-flow. But he is equally silent about the destruction of Pompeii and Herculaneum. When he says, "The eruption from Mount Vesuvius flamed out in several places with much violence," ‡ I think he must refer to such an appearance as a lava-flow would produce at Stabiæ, where it was observed; which was between eight and nine miles from Vesuvius.

(7.) He was evidently disappointed, though he did not say so. It is natural to suppose that such a meeting of fire and water would cause terrific explosions: but this is not the case; "for, as soon as the lava enters the sea, the rapid evaporation of the water that comes into immediate contact with it accelerates the cooling of the surface, and thickens the hard external crust to such a degree, that very soon all communication is cut off between the water and the fiery mass. . . . Breislak informs us, that, in 1794, the eruption of a

* Pompeii: Library of Entertaining Knowledge, p. 41.
† Ibid., p. 48. ‡ Ibid., p. 48.

lava-stream into the Bay of Naples, near Torre del Greco, took place with the greatest tranquillity, so that he himself was able to observe the advancing of the lava into the sea while seated in a boat immediately near it, without being disturbed by explosions or any other violent phenomena." *

A POMPEIIAN PROCESSION.

JULY 7, 1873.

I took a piece of the mosaic from Pompeii previously examined, and powdered it. Sherman had for several days been examining Connecticut-River foot-print specimens, and very naturally supposed that this was related to palæozoic times.

"Well, I don't know: I put this low enough to get far back; but I do not seem to be. I see people and a town.

"There seems to be some kind of excitement here. Many people are running round in small circles, and others hopping round. It seems to be some kind of religious performance. It is in front of a building that looks like a church.

"Now I see a great many people in procession, marching with banners. On one is a picture of a person with six arms, — two in front, and two over each shoulder, but not joined to the body. The streets are very crooked, and quite narrow.

"A man is painting some kind of an animal on the side of a house. I cannot tell what it is going to be; but it has horns and wings. It is a light surface; and he chalks the design a little, and then paints a little.

* Hartwig's Subterranean World, p. 78.

"At the head of the procession is a man, all in armor: he looks well. He has a row of red-and-white feathers on his helmet: some of them hang down to his back. There are soldiers with spears and shields."

A SPOON STORE.

"There is a spoon three feet long hung up outside of a store: it is a spoon store. There are some pretty spoons. Some look like pewter, but others like silver. I believe they are all silver: those I thought to be pewter are unfinished. The finished ones are all engraved. I see one with a face on it. (Draws Fig. 26.)

"There are a great many different kinds. I see a very handsome one now: it is about as large as a table-spoon, and round-ended. (Draws Fig. 27.)

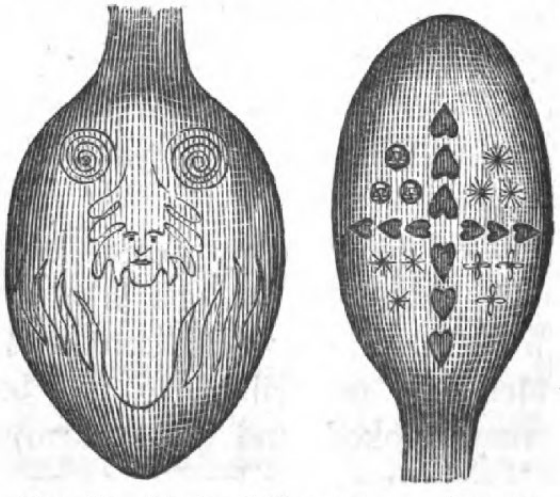


FIG. 26.—Bowls of silver spoons.—FIG. 27.

"The store is on the street; and there is a work-shop back of the store, where they make and engrave them.

"I see a man coming through the street drawing a small cart full of oranges. There are some blood-oranges among them. They are all sweet. He goes round and leaves a basket at certain houses, and does not wait for payment.

"I see a splendid spoon now. (I went back to that place.) The bowl is plain; but the handle is handsome. (Draws Fig. 28.) I think the foot is imaginary.



FIG. 28. — Handle of silver spoon.

"I declare! The man who engraves has ducks' bills, birds' feet, horned beetles, and other insects, an eagle's foot, and other things. He copies part of one, and part of another, and makes some curious-looking things.

"He has flowers growing near a window, — blue flowers, that look a good deal like a violet. There is glass in that window; but it is not clear: it has a smoky look.

"There are several men at work casting those spoons. They have pretty bronze moulds, made by this engraver. He has some tools, that seem to be

quite hard, that are made of bronze. They must have some way of tempering it.

"The engraver draws the ornaments with something black, and then follows with his tool.

"He has a curious file, — coarse at one end, and fine at the other, and graded from fine to coarse all the way. It is about two feet long, two inches broad, and a quarter of an inch thick. It is cut on both sides and on the edges, and is made of bronze.

"One of the men is getting his dinner ready. Above the shop is a loft where pigeons are; and he goes up and gets about a dozen of their eggs. He breaks them into a jar, and stirs them up, while he puts in a yellow powder of some kind, and makes a sort of a cake, which he is cooking.

"They have a great deal of silver in here, in bars three or four inches long, two inches wide, and an inch thick: they look like little silver bricks.

"There are black people here in the street, selling white grapes: the bunches are very large.

"The engraver has a good tool for making lines parallel to one another. Several tools with sharp points are joined together at an equal distance from each other. He can make ten rings, one inside the other, just as easy as one, or ten straight lines. He has one that cuts two lines at once, and others for other numbers. This silver cuts very easy.

"I see a machine in this shop, that may be meant for a clock. A small stream of water falls on to a wheel with paddles, that turns other wheels. One wheel is large, and has different colored ribbons on it: that may be to tell the time. It is eighteen

inches in diameter. The machine is on the side of the wall; and the engraver looks over to it once in a while (1).

"It is made of wood and bronze. The wheels are very light. Boxes cover up a good deal, so that I cannot see it all; but I hear an irregular sound inside."

("How large is it?") "It extends from the wall about three feet. The large wheel revolves near the wall: and there are figures on the wall round the outside of it, from one to twelve; the figures being represented by straight lines up to six, and then by lines across them up to twelve." (Draws Fig. 29.)

(1.) This was evidently a clepsydra, or water-clock, of which Sherman had never heard. In its construction it seems to have differed somewhat from all of which we have any description; and there are some portions of the drawing that seem incorrect; but he says that such was its appearance.

"The clepsydra invented by Ctesibus of Alexandria, B.C. 145, consisted of a jar containing water, which slowly escaped by a hole at the bottom; while the oar of a miniature boat on the surface, as it sank with the fall of the water, pointed out the hours, which were marked on the side of the jar." *

Vitruvius describes a clepsydra, which he attributes also to Ctesibus, which was more complex than this, and more like the one seen in the examination. "Water was made to drop upon wheels, which were thereby turned. The regular movement of these wheels was communicated to a small statue, which,

* Chambers's Information, vol. i. p. 279.

gradually rising, pointed with a little stick to the hours marked on a pillar which was attached to the mechanism." *

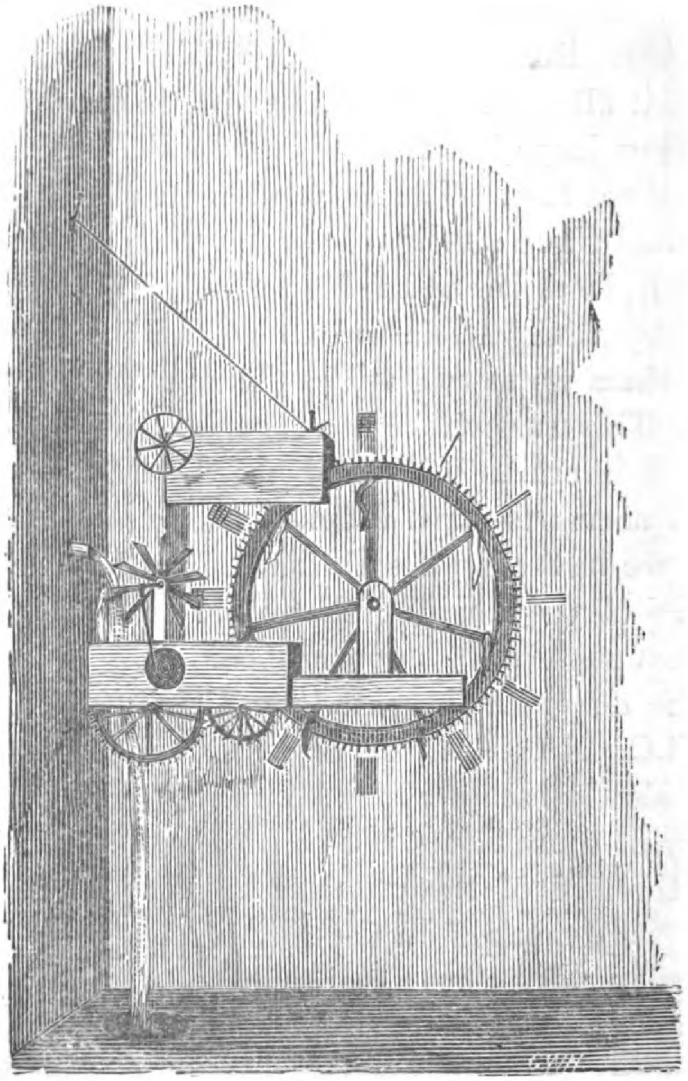


FIG. 29. — Clepsydra, or water-clock.

* Smith's Dictionary of Greek and Roman Antiquities, art. "Horologium."

SCHOOL FOR GLADIATORS.

JULY 11, 1873.

Same specimen: —

"I am in a very large room: it is a hundred feet long, fifty wide, and very low, — not more than a few inches above the men's heads. There are a good many here that look like soldiers, and are dressed in armor. Around the room are hooks to hang their armor and swords on. I see spears leaning against them. The swords are broad, and the cutting-edge is rounded. (Draws Fig. 30.) There is a hollow where they grasp them; and their hands are protected.



FIG. 30. — Gladiator's sword.

"A little way from here is an open place, a kind of yard, where they are having a sort of sham battle."

("Describe their armor.") "They have a helmet with a wire guard over the face, plates of metal that shine, — bronze, — over the breast. They have cloth over the foot that answers for both stocking and shoe, and a plate of bronze attached to that for a sole.

"I believe there are masters here that teach. Two are fighting, and one keeps talking to them all the time.

"How different this city looks at different times! I do not think I have ever seen it twice alike. I see now a very large building, higher than the rest, a good way from here, and a little to one side of the centre of the place. The houses are more varied in height than I have seen them before."

THE AMPHITHEATRE.

("Go to that large building.") "It is a theatre, or some such place. I see many ladies hold of hands, dancing round a very tall one that stands in the centre. I think she must be seven feet high."

("Describe the place.") "There is a circular or oval place in the centre, where the women are; and, from that, seats all the way round, — one row above the other. The top is covered with what looks like canvas; but it is darker, — about a mahogany-color. There are poles in the middle and all round the sides to hold it up. Outside, the top looks like a very large tent; the centre being about thirty feet higher than the sides. The poles are all ornamented with scroll-work of different colors; but the principal color is blue. It is quite breezy here: there is good ventilation.

"A number of men dressed like those I saw in the large room form a circle between the audience and the performers: they make the line between the two.

"Musicians are playing on various instruments.

There are several harps, with different shaped heads on the end of them. Some are quite tall, and some short. (Draws Fig. 31.) This is a board, with strings on it.

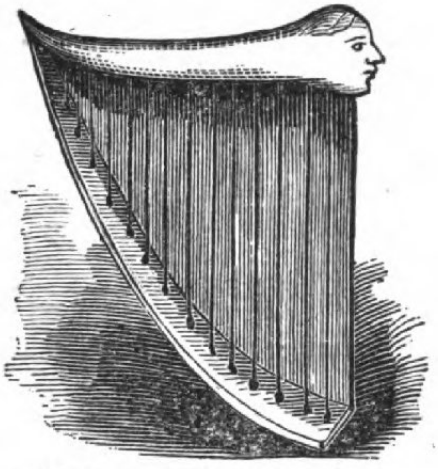


FIG. 31. — Ancient Roman harp.

" One instrument looks as if intended for a violin ; but it is a curious thing. There are about ten strings. It is placed on the lap, and played with a bow ; but I see no way to tighten it. I see now : the strings are fastened to pegs, which they turn with their fingers. It sounds like a violin, but is rather squeaky, — not so pleasant (1). (Draws Fig. 32.)

" I see several instruments made out of horns of cattle, and with two or three bronze keys that they work with their fingers. One has holes at the top ; and the player has a small instrument in his hand that he lowers into one hole, while he holds the other hand over the others, and thus modulates the sound. He is very particular, and it seems to be difficult.

" The performance is going on. There is a very tall man, made by a man with a long pole and a head

on the top of it, dressed to look like a man. The face has a large mouth: all the false faces that I have ever seen in this city have.

"There are many men in the circle fooling with this man: they are talking to him, and he is replying. It makes the audience laugh a good deal. He has a small string attached to the lower lip of the head: he pulls, and a spring shuts it again, so that it looks just as if it was talking.

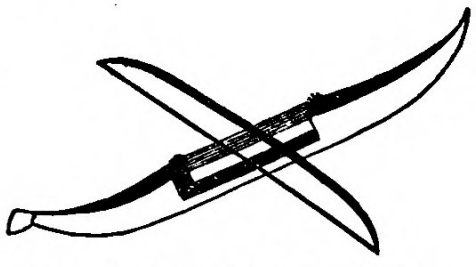


FIG. 32. — Ancient Roman violin.

"They have a singular contrivance for making a great smoke. The men that stand round throw something down that explodes, and makes such a smoke that the people cannot see for a little while; and then this man undresses and dresses again. He is a tremendously fat man now. The people look surprised. He is talking again, and they are laughing more.

"An extremely tall, thin man comes out now, with a very singular mask on. The fat man runs to meet him. They have both got down, and are hopping toward each other like two bull-frogs. They are up again: and the tall man walks completely over the other, as if he never saw him; and that causes him to fall, and he pretends to be badly hurt. Both are

pulling out their weapons now: they are nothing but pasteboard, but are painted so that they look like bronze swords. They strike; and the fat one strikes the other on the head, and takes off the top of his mask, so that it looks as if the top of his head was gone. (I suppose it was cut before.) He hunts round for the rest of his head, finds it, and runs off to a room at one side. The other follows him, stripping off as he goes, till he is as lean as he was at first. This is the last performance. It is not near as good as the one I saw before" (2).

(1.) It is said that the violin was invented in the fourteenth century; but M. Charles informs us, that, on medals of the highest antiquity, Apollo is represented as playing on a three-stringed instrument closely resembling the violin.*

(2.) He refers to the performance in the little theatre.

HERCULANEUM IN THE BRONZE AGE.

Of the history of Herculaneum — a city buried by the same eruption of Vesuvius that overwhelmed Pompeii — we know very little. It was situated on elevated ground close to the sea, and is said to have been, at first, a fortress occupied by the Osci, Tyrrheni, Pelasgi, Samnites, and lastly by the Romans, but was probably occupied long before any of these existed. Being nearer to Vesuvius than Pompeii, it was much more deeply buried; and but a small portion has been exhumed.

* Penny Cyclopædia, art. "Violin."

The specimen tried in this examination was a small portion of lava from there, examined by Sherman, who knew nothing of its character, or the locality from which it was derived.

"I see a hill as large as Durant's (a hill near our village, about a hundred and twenty feet high), and a village on the side between it and the ocean. There is a large river near the village. It is a delightful place.

"The tide seems to be out now; and there are beautiful shells, but not large. The climate does not seem to be tropical, but sub-tropical. There are a great many herons on the beach, that look, in the distance, like soldiers."

("Examine the place and the people.") "I see two men coming down to a boat. It is not very nice; but there is considerable work about it. They seem determined to have the boat look well, whether it goes well or not. It is ornamented with figures. On each side of the row-lock is a head of a lion, made of brass. I can see where the oars have made it shine. The people are dark-complexioned, and have black hair and black eyes: they look like sailors. On the side of the hill are a few short trees.

"I notice, that, as the wind comes in from the sea, it makes it quite foggy at times. The cold wind condenses the moisture.

"The men are out now quite a way. They are fishing. They are very talkative. They use small fish for bait that swim around. The hook is brass, and has a barb on each side. It has only one point. They seem to use a great deal of brass.

"They catch queer-looking fish. If they were long enough, they might be called eels. They are short and chubby, and about the same size from one end to the other. They look like part of an eel.

"There are very tame birds here, something like a steamer-duck. They make a dash for the hook, when it comes up, to get the bait off."

("Go to the village.") "It is very foggy now; but I can see it. I have come to a fish-market. They have monstrous fish here, — one that looks like a fishing-frog, and skates cut up in slices. The people must live on fish.

"The houses are made of boards, and some of logs with board fronts. They make great use of brass. I cannot understand why. The hooks they hang the fish on are brass. I should think it would poison the fish (1). They hang them by the tail.

"They have some tame animals that are quite fat. One looks like a cat; but the ears are long, and droop at the end like the ears of a lynx (2): it is an animal of the cat tribe.

"I see another place where they keep birds for sale. I see no domestic birds (3). There are a great many water-fowl; some pretty ducks. They put a stick through their eyes, — a fine stick, — and it is supported by little poles.

"There are people in the middle of the street without hats, in the hottest kind of sunshine, eating their dinners. They are sitting cross-legged, with two or three dishes before them, but not much in them. Some of the people wear conical hats, made, I should think, of reeds or fine grass.

"They have some very large white-winged birds nearly as large as a turkey. They do not look like geese. They have those on large sticks. A man comes with them on his back. They sell them very fast. They use the feathers for something: I see them picking them off. I see no cranes.

"They have curious money, very. It looks like a cent; only there is a hollow on one side, and a bunch on the other. It shines like gold; but I think it is brass (4). I see no figures on it. It is brass. I smelled of it.

"Those birds must be caught in nets. Their necks are all broken; but I see no other marks on them.

"The people carry their money in bags, — leather bags, in the inside of their jackets. They are on buttons; and they open them by pulling a string. Every man has a bunch on his breast, that you can see through his jacket. There are a great many loafers leaning against the sides of the shops, and watching. I can see a row of green heads, as long as the side of this room, that look like mallard-duck heads.

"I wish I could understand what they say. It seems like a language easy to speak; no difficult sounds in it.

"The shops are all open on one side. They allow nobody to go inside. The money is of different sizes, but pretty nearly all alike.

"I see some beads on a woman's neck, — blue: they look like glass. I don't like the look of the women. They don't look near as well as the men. Their hair is down over the forehead very carelessly. They look like slovens. The men are the bosses. I saw one

man stamp his foot: his wife was after him, and away she ran."

In answer to questions: —

"The streets were very narrow, and carts could not have been used in them. When they moved any thing that was heavy, two men carried it upon sticks.

"It was so foggy, I only saw that one boat.

"The coins varied from the size of a gold dollar to that of a copper cent."

(1.) He seems to have had no conception that the reason why they used bronze, or "brass" as he calls it, was because iron had not then come into use.

(2.) "In China a breed (of cats) has drooping ears." * It is very probable that the domestic cat of Italy at that time was specifically distinct from ours.

(3.) Our domestic fowls were probably unknown to the inhabitants of Italy at that time, as they were unknown to the Swiss lake-dwellers. They seem, moreover, to have been unknown to the Greeks in the time of Homer and Hesiod.†

(4.) "The Romans had no other coinage except bronze or copper till B.C. 269."‡ I think it is probable that the first coins were as rude as he represents these to have been, — probably too rude for numismatics to collect or value. The earliest coins that we possess bear a device only on one side, and have an indentation on the other.

* Darwin's Animals and Plants under Domestication, vol. i. p. 64.

† Lubbock's Prehistoric Times, p. 192.

‡ Smith's Dictionary of Greek and Roman Antiquities, art. "Ass."

CLAY MODELLER AT WORK.

JAN. 5, 1873.

Same specimen; locality still unknown: —

"I am beside a very still lake: it is just after a shower, and the drops are dripping off the trees. I see a couple of squirrels on a tree making a great racket.

"There is a heavy forest round the lake.

"I see great heaps of shells on the banks of the lake, as if muskrats, or some such animals, had been eating them. As I went round a bend, I saw a couple of storks or some other wading-birds.

"I went to the top of a hill on the other side of the lake, and I saw where there were some houses. The scenery is the same; but the houses are different: they are better looking.

"I can see in the distance two mountains that I did not notice before. Where the mountains are, there is a cape that goes out into the sea (1).

"I see a man making figures out of clay, — men, women, and children. He uses little wooden tools to shape them. Some of them are very pretty. He places them in the sun to dry (2).

"He has a stamp like this ※ that he puts on the pedestal of every one. It is his trade-mark. He puts down a lump of clay, and then cuts it off till it is shaped into the thing that he has in his mind. He is in the best house in the town. There are in it a number of handsome statues. Some of them are painted of different colors. One has a basket on its

head. He paints these clay figures: he has the paints in round boxes that look like tin or silver, but a little yellowish. The paints are semi-fluid.

"He is making some kind of an animal like a cow: he does it very quickly. When he makes a slip, he rubs a little on again from his finger, which holds what he scrapes off."

("How is he dressed?") "His clothes are not cut and sewed, but wound round him, with places cut for his arms, which are bare. He stamps the clay out for the stands: he has a number all ready for use.

"In front of his house is a statue leaning forward. The statues stand the weather very well. He makes the folds of the dresses very well indeed.

"He has a tub full of this whitish clay, and he keeps it damp by wet cloths over it. It does not take the figures long to dry.

"A man has just come in after one. He paid him with those coins that I saw before; only they seem to be better finished than those. They have a face on the rounded side, and little scallops round the face. One side seems nicely finished; but the other is flat. Some of them are quite thick for their size.

"I thought he was going to make a cow; but it is some fanciful animal with horns, large teeth, and notches on the back like a crocodile.

"He has a curious little money-box, with an animal like a cat sitting up on the lid.

"One statue has the most horrible face he knew how to make, — wrinkled forehead and cheeks, long nose, and beard that stands out. Here is a pretty vase,

with a crane on each side at the base, and artificial flowers inside."

(1.) The topography of the country has been so greatly changed, that it would probably be vain to look for these distinguishing marks.

(2.) Clay so easily shaped into form must have been one of the first substances employed in making figures. In Italy we are informed that it was used from the earliest times, and never fell entirely into disuse. "Some ancient figures of clay are still preserved." *

VICINITY OF ROME IN THE STONE AGE.

Rome is, on many accounts, the most interesting city that was ever built. In past times, first the military and then the ecclesiastical mistress of the world, she is still the centre of by far the most numerous body of Christian believers, who look with reverence to her from all parts of the world; while their donations still enable her to give some indications of her former grandeur and glory.

Long before the myth of Remus and Romulus was formed, the spot now so famous was inhabited by numbers of tribes, lost for thousands of years before history was born. Psychometry opens the door of the past, and reveals them; and we shall yet learn the detailed story of their origin, their existence, and their exploits. Here are a few glimpses.

Piece of agate from the mausoleum of Augustus, Rome, examined by Sherman April 28, 1873: —

* Smith's Dictionary of Greek and Roman Antiquities, art. "Statuary."

"I see some pens to keep animals in, like those rat pens I once saw (1). There are mountains here on each side of a river valley where there is a marshy meadow. There are about a dozen houses here, and a small stream runs through the meadow. It is very pleasant. I can see snow on the mountains, and small streams dashing down. The stream in the middle of the meadow is just alive with birds and reptiles, — water-newts in a great mass. I see many birds' nests along the bank." ("Attend to the people.")

"The houses are on a slope on one side of the valley. They are round, with conical roofs, and made of clay and sticks all stuck together. Inside, you can see where the clay is thick and thin; for the light shows through where it is thin. The houses are large: a hundred persons could stand in one. I see a great many children, but no grown persons round: it looks as if they were all away. Near one of the houses is a clay tub or barrel, as much as six feet across the top, and very thick. There is nothing but water in it. It is full of wigglers. It sounds just like a barrel when I talk inside of it: I seem to hear the echo of my voice.

"I see places for beds. (They make a great use of clay.) The bed-posts are clay. The bed is low. Sticks are laid across different ways on clay posts, and furs are laid on them that look like buffalo-skins; but one might think they had been used for a hundred years. They are very flexible. The edges are cut into fringes, and the hair is twisted for ornament.

"The bed is rounded to fit the side of the house. Shelves are cut near the corner of the bed into the

clay wall; and on them I see a number of things, — wooden forks, I suppose; clay bowls, that look as if they had been dried in the sun (one of them a foot in diameter), full of seeds in pods like bean-pods, not quite flat. They seem to be all kitchen-utensils. Some look like plates. There is a large wooden spoon: it looks like a pipe; but the hole does not go through it.

"I see a great band of the people coming home. They have the queerest-looking caps I ever saw on any one. They look as if made of twisted rope wound in a spiral. They act as if they were drunk. They seem to feel well. They have a kind of torch that looks like a burning castle, — like their houses; but it has windows, and they have not. It is made of clay, and is on a stick. The light comes out in streaks. It would look nice in the evening. They take the top off to put fuel in: it is something like pitch. They have a good deal of it, old and hard. At the end of the handle of the torch is a knob, carved to resemble a buffalo's head.

"I see a crowd behind now, with animals. One has a snake alive, — a large one: it seems to be tame; for it twists all round him, and he does not seem to care. Another has a mammal with a long tail: it seems to be a monkey; but the face is cat-like. One of its legs is broken, and its face battered. They take turns in carrying it. Some of the people are entirely naked, and as dark as a dark mulatto. Their hair is short and dark. They are not fleshy, and some are quite poor. I should think they would be good runners. They have a great many gymnastic performances, — running, jumping, and dancing. Some hot

pitch fell on to one man's back: how he jumps and howls!

"They have all gone down to one of those small streams after fish. There are some fish as large as a sucker. One fellow has got a handsome one: it is dark on top, and light underneath. Its skin is like a horn-pout's. It is very slippery.

"Here comes one of the fellows running with an armful of bows and arrows. They are jumping out of the water, and going for them.

"Now some men are below, and some above; and they are driving the fish together, while others stand on the bank to shoot.

"One man has a bow as tall as himself, and arrows made of stone, with edges like saws, all notched. Every thing about him is well done. He has a belt round him cut into tassels, and a pocket in this full of arrow-heads. The pocket is made by splitting the hide. (One of the men has a white streak down his leg, where he has been badly cut.) All his arrows are notched, and very perfect and handsome.

"They have a good many fish now. One man is carrying about a dozen. I can see fish running with arrows in them above the water. The men wade in and lay hold of them, and pull the fish out on the end of them. There are thousands of fish here. I should think they came here to spawn. There are fine red spots on the gills of the fish.

"Some are eating the fish raw. There seem to be two parties here. Some seem more civilized than others. The one I saw eating the fish raw seems very low and brutal: he has very high cheek-bones, and

his teeth stand out like a monkey's. There are two or three others like him: they are considerably darker than the others too. The two parties do not agree very well, I can see. These (the inferior ones) have poor arrows: they look like common stones almost.

"The stream is very clear in spite of all their wading in it.

"Oh! I see one fellow here with a long spear, who has got more fish than any other: two of those low fellows are carrying them for him. The end of his spear is a bone, or tusk, barbed and curved.

"They are going now, with a great many fish on sticks put through the gills, just as the boys do to-day."

(1.) With a Pompeiian specimen, page 214.

Eleven years ago, when Mrs. Denton was examining a specimen from Pompeii, she discovered dark-complexioned people living in houses made of clay. At the time, it seemed to me unaccountable; but it harmonizes well with Sherman's more recent descriptions.

"I see something built up, but very rude. It is round, and made of clay. It is hollow, and about three feet high, with an opening on top. The ground is scraped off round it.

"I see three persons, a woman and two children. One lies down: something keeps his head up; and there is some covering over him. The youngest is about three years old, and is naked. The mother clasps it in her arms; and I actually feel the sticky sensation produced by the contact of their bodies.

They are dark-complexioned. The woman manifests great attachment to those children: they must be her own.

"I feel the influence of a stream somewhere near, though I cannot see it. There is a great mound, long and hollow, and roundish on top: it is artificial. People live there. It is made of clay."

VICINITY OF ROME AT THE BEGINNING OF THE BRONZE AGE.

MAY 2, 1873.

The specimen from the mausoleum of Augustus: —

"I see some houses like Esquimau houses, rounded over, but made of clay, smooth and nice: they look better than those I saw the other day; but they are not near so large (1). It is real nice in here. There is a chimney that goes just to the top. The fireplace is made of clay, with walls about a foot thick, and a cover on top. It looks a good deal like a stove. It is smooth on the top.

"I see many shelves in the walls: one place where they keep short spears four or five feet long. People are lying round sleeping in places scooped out of the sides of the house. (I see skins hanging up on wooden pegs driven into the clay.) They are pretty well dressed. One man has pants made of leather, — skin with the hair off, — and above that something wrapped round him. They have many ornaments, — white rings, — four or five on each arm. I think they are ivory on this man's arm. They are lighter-colored and better-looking people than those I saw before.

"A woman has come in, and is putting fish on this smooth stone to cook.

"The place is about fifty feet above a small river: a bank slopes down from it. It is a good place to look off. I can see a long way. There is a mountain, and some hills round it. Half a mile off I see a regular village of those houses, — about fifteen or twenty.

"I see them building one. They take small trees growing, and bend them over, leaving the branches on. They bring clay from the river; no easy matter to get it out. They have stone implements like shovels that they use, pushing them in, and cutting it out. They work diligently.

"I see two strange-looking houses joined by a low passage-way. It is very dark in there. It is a place to sleep in, I see. There are bunks scooped out here. I see one place where they have piled brush inside, and set it on fire. It may be to burn the twigs away, or to harden the clay.

"Some boys about as large as Shelley (thirteen years of age) are making clay images near the river. They are rude things. When they make a man, his arms are spread out.

"I am over to the village now, at the largest house. It seems to be a public place, — a kind of store. Here are dead animals of different kinds, some fishes. They eat lizards. I see many of them about a foot long. There are things here that look like hoes. They are made of stone, and have a handle tied on: there are many of them. There are some nice baskets, and a great many jugs for use, that look like molasses-jugs. They are ranged from small to large on a kind of

bench. One of them is about four feet high. Some have noses like pitchers.

"I see some live turtles now. This house seems like a kind of market. There are a good many people here. Some of the things look quite modern. I see those smooth stones for sale that are put over the fire. I see them exchange one thing for another, — no money. I see what look like brooms, made out of sticks, for sweeping, and many of those stones for digging the clay.

"I see a bird running round: it must be a pet. It is some bird that lives on carrion: it is dark, and looks something like a vulture.

"Oh! now I see one of those large jugs full of water, with craw-fish in it. There are some pretty spears here made of bone, and curved as if made of a curved bone, or tusk.

"They have musical instruments here, made of metal, that look like a gong. They seem to have been pounded thin. They look like bronze. There are a great many of them. I see some metal tools on a handle, like the instrument a shoemaker has to smooth pegs off with (2).

"One fellow comes in now with a very long string of fish. He seems to be one of the owners of this place. He has one of those spears with him."

ROME IN MORE MODERN TIMES.

"I am in a different place altogther. There is a meeting in a grove, with a chairman, and a man speaking. I cannot understand the language. It seems to

be at this time. There are nice seats with nails in them. The people are dressed in old-fashioned style. It cannot be long ago, though. This man seems to be much in earnest: he is talking aloud, and thumping on a board in front of him. He has a short coat on, and a star on his breast. Many of the men have the same. The ladies wear a sort of short jacket and dress."

ROBBERS IN ANCIENT ROME.

"I am in a different place now. A woman, two girls, and a boy, are on a high wall. They are barefooted, and carrying something on their heads. It is evening. This must be the wall of some city: there are many houses round. These people have been out selling things, and they are carrying dishes and trinkets for children home with them. It is back in time. Some of the articles are made of bronze. There are steps in the side of the wall, that go down slanting.

"They are down in the street; and I can see some watchmen going round with lights on their hats, that shine all around them. They have wires that bend over to the top; and the lights are held by that over the head. They carry knives of bronze; but they are flexible. There seems to be a fire in the city. I look over, and at a distance I see what looks like the light of a fire.

"I see some fellows who are trying to conceal themselves from this watchman, — three or four crawling along in the shadow. They are thieves, I think. He is looking at the light of the fire; and they are on the other side of the street. One got up and ran, and

the watchman after him; but the others never stirred. Now they get up and go by those steps on to the wall. (I should like to know what the walls are for.) The houses come right up to the wall. One of these men has gone into one through the window: the others go on and leave him. He is laying his hands on to things as fast as he can. On a shelf there are knives, bronze images, and money; and he has taken them.

"Oh, he is caught! There was a watchman outside; and, when he got out of the window, he seized him; and, when he kicked about, he threw him off the wall. He is moaning below there: I think he must be nearly killed. The watchman has gone down the steps, and up to him. The man shows fight: he has a couple of knives. An old woman that lives in the house is out now: she ran along the wall, and down the steps. She is a horrid-looking thing. She is hunting for her things. The watchman is knocking the weapons out of his hands. I guess his leg is broken. The old woman goes at him, and takes her things from him. (The light did not go out when the watchman ran.) She has a big stick, and is laying on. He is giving the things to her. He seems to be about half dead. The other fellows on the wall looked down, and then ran. (She is bald-headed.")

(1.) Fig. 33 represents one of the rude clay habitations of an early period in Italy. Of the vases of which this is a representation, Dyer says, "A quantity of cinerary vases were discovered in the neighborhood of Alba, which belong, unquestionably, to the first inhabitants of Latium, and ascend beyond the earliest known epochs of Italian history, since the spot in

which they were found is entirely covered with thick beds of lava which have flowed from Monte Albano, a volcano of whose eruptions all memory is lost in the night of antiquity." *



FIG. 33. — A vase in the shape of a hut.

(2.) There is no doubt, that, early in the bronze age, stone and bone would still continue to be employed for various purposes. At this time they had stone implements for shovels and hoes, bone spears, but bronze gongs and tools; perhaps obtained, in exchange for skins or other articles, from more civilized Eastern people.

But what had all this to do with the mausoleum of Augustus? Nothing, apparently; but the specimen was related to the city before the mausoleum was built, and to the country, and the people that inhabited it, before the city was built. It is most easy for Sherman to obtain the influence of savage people, apparently because he is most attracted to them; but the influences of more modern times, as in this examination, are occasionally manifested.

* Dyer's Pompeii.

MAUSOLEUM OF AUGUSTUS.

MAY 15, 1873.

The same specimen was examined by Mrs. Denton, who obtained more modern conditions, and evidently those that belonged to the mausoleum.

"I am in a room where there are statues and bass-reliefs in something white. A low base forms a division in the room. The floor is of the same material as the base, — something very solid and pure. I think it must be stone. The bass-reliefs are cut in stone, and are magnificent. I see a large slab of marble in the wall. The floor has a peculiar sensation, — one of great purity, whatever the material is. (I do not see well.)

"In the corner is sculpture, canopied, with small columns in couplets attached to it. This, also, is magnificent. But there is an influence here that is very unpleasant. The two influences are very much at variance. However clean the place may be made, an impure influence still remains; though it is not in the material of which it is built."

MAY 16, 1873.

"I saw a woman then, with long drapery about her, that stood with her right arm up, as if to keep out the light.

"I cannot get any very religious sensation from this, though I have been trying.

"I see, now, something like a hanging-seat, with very elaborate ornamentation about it on the sides and overhead. I see others. They appear to be swinging-seats.

"I am inside of a building now, and in the room where I saw sculptures on the walls. These are not there merely for ornamentation. It is a peculiar place altogether; and there is much that I cannot describe.

"I see shadowy figures here that do not look like living people. There are three sitting together at one side. One seems to be a woman. There are others in the same room.

"This is not a four-walled room. There are deep recesses, like other rooms, only there are no doors, and shallow recesses besides; so that there might be a company in one part, and those in the other part would not know it. The walls seem heavy.

"There are different influences here, or I get the influence of different places. If it was a charnel-house, I should not be surprised. There is that sensation about it. There has been something of that kind about it, if it is not that now. I can see places where there are dead bodies. I can understand now what those canopies were for: they were for persons of importance. There was a great deal of elaborate work about them: others were more plain. I do not wonder that I did not like the place. There is a horrible, deathly, sad, melancholy feeling about the place.

"Those three that sat in the corner I cannot see since; but I can feel their influence. They must have belonged to one family; for they looked alike. They moved. I can give no opinion regarding them. They had a dark, dead look about their faces. They were slender. They looked as if they had been dead and dried; but they moved. They had a mummied look. There may have been some defect in my vision.

"There are singular shelves that stand out from the wall, that I do not understand. They may be to lay bodies on, with the head toward the wall.

"I think it is in the East; but I cannot tell what country."

The mausoleum of Augustus was built by the Emperor Augustus. It was of circular form; and round the inner circumference were thirteen sepulchral chambers, and a large chamber in the centre. The walls must have been of great thickness; for they supported three terraces that were planted with trees. The uppermost terrace was crowned with a colossal statue of the emperor.

ROME IN ITS GLORY.

JANUARY, 1869.

The specimen examined was a fragment of marble from Nero's Baths, Rome. Sherman knew nothing regarding it. I merely told him not to go farther back than the human period.

"I see a splendid house. It is very high and very beautiful. All round it is pretty. There are fine large trees set out. There is a beautiful bridge over water: it looks as if the stone was polished. It has a color something like slate. It has five quite large arches. It looks as if I had got ahead of the present time instead of back in time.

"Such boats I never saw before. Some look as if they were made of cork, like life-boats. They are very beautifully painted and gilded; some of them with splendid row-locks and oars: men row them.

The men have red jackets and yellowish-white pants on. I can see two or three such bridges as I saw, down the river some way.

"Some men are fishing out of one boat. They are pulling up a large net. The fish look splendid. There are some curious fish among them. Some have one-sided tails; some are eels. There are many kinds of boats here: some have flat bottoms. Some of the sails look like fins of great fishes.

"Between the bridges there are great stone fences (walls) on the banks. They are to prevent people going down to the river, I guess.

"When the boat I am on goes under the bridges, I can hear the rumble of carts and carriages overhead. Some of them look like stone boats, — very low, — and have wheels a foot thick, made of wood. The driver stands up. Some have boxes and barrels on them, and something in them that looks like molasses; but it is not. The masts of some ships come almost up to the bridges.

"I am down the river; and I can see where the ships come in. There is a bridge there that turns, and lets ships come through. I never knew that ships carried a lamp in front, like an engine; but I see one here that does." (After a pause, he continued.) "I went too far back. There are great crocodiles crawling, and woods all around. The river is smaller, and not so far down and so swampy. Big, sleepy crocodiles are crawling over one another. It is like the Dismal Swamp." ("Come toward the present time.")

"I see woods cut down a little; now a little old

shanty; now two or three houses, and a little weak bridge that looks as if it would break down. Now I see a better bridge, and two or three good houses, and the swamp filled up. Now a rough stone bridge like ours; then a better one, but still made of rough stone; and the boats are poor. There is quite a city now. Now shining, polished bridges, many boats, and a big city. It does not look like the same place to go back to those crocodiles."

CARTHAGINIAN ART-GALLERY.

With a coin said to be from Carthage, Sherman obtained the following. He knew, of course, its connection with some ancient people.

In ten seconds he said, "I saw an emblem worked with gold wire on silk, then a picture-frame, and then a crown. One turned into the other like dissolving-views.

"Now I see a magnificent room all filled with painted pictures. One, about eight feet tall, represents a lady picking flowers; and another a man on a boat, and fields and village in a distance; another a river near the ocean, and ships going up. Another picture is that of a large beetle going to light on a rose. Then a dish full of fruit: among them are grapes, and something like a crooked-necked squash, but small. Then a very old man, with a long cane, and a long, white beard.

"Now I see an image of a sphinx, — a woman's head, and a lion's body: it is made of clay, and painted brown. There is a case about six feet tall, and four

feet wide, with glass over it; and inside is a collection of knives and swords. They look nice.

"There is a picture of a great crowd; and in the middle a great thing stands up, that looks like a steam-boiler with many holes in it; and another of vines over an arch, and dark flowers on it. A lady is walking under it, and a bird is sitting on it.

"The room is very long, and the ceiling is painted. Strings of beads, of different colors, form inverted arches from one side of the room to the other, both ways. A string of red beads hangs down in the middle.

"A large picture occupies the whole end of the room. At the right-hand end is a king in a chariot, with a spear in his hand to throw at several men who are clad in armor and have spears also. An armed man drives the horses for the king; and he has spears and a shield (1). The horses have plates of armor on in front. An angel stands between them with outstretched wings, and seems to be separating them. The angel has a pretty face. The king has a crown on. Two horses draw the chariot. The man that drives stands back of the king, and is all covered with armor; and he has several spears in one of his hands. The king's face is bare, and his left hand is full of spears. The painting is all done in light and dark brown. The outlines are sharp and clear. (Draws Fig. 34.)

"A good many people are looking at the pictures. They are not real white people, — dusky. They have both straight and curly hair. The women have long shawls. The men's pants go down to the knee,



FIG. 34. — Carthaginian picture.

and they have stockings below. They wear a kind of cape on their shoulders.

"I see the picture of a fight between a man and a bull, and another of a man falling from a very high cliff."

(1.) The shield he neglected to draw.

THE SWISS LAKE-DWELLERS.

In the year 1854, the water in the Swiss lakes was unusually low; and the inhabitants of Ober-Meilen, on the shore of Lake Zurich, took advantage of this to obtain mud from the bed of the lake to increase their gardens. In doing this they found many wooden piles, deer-horns, fragments of rude pottery, and implements of stone and bone. It became evident, from a careful examination of these, that some long-lost people had once dwelt on platforms, supported on piles which had been driven into the bed of the lake; and that a considerable portion of their history might be read by the relics thus preserved. Similar deposits were subsequently found in Lakes Constance, Geneva, Bienne, Neufchâtel, Pfeffikon, and others. On some of the lakes there had been several settlements; indications of no less than forty-nine having been found in Lake Neufchâtel.

In some places, all the implements found were composed of stone and bone, and the fragments of pottery found with them were very coarse; in others, bronze weapons and utensils were found, and pottery of superior workmanship, indicating a people more

advanced in civilization. An immense number of axes, hammers, knives, lances, awls, saws, chisels, and other implements, were exhumed; and archæologists have had the great delight of rescuing from oblivion a remarkably interesting people, and watching them as they emerged from an early and rude form of civilization to that of Europe in historic times.

Dr. Keller, who has done so much to bring the lake-dwellers before the world, gives the following account of the way in which their dwellings were reared: "Piles of various kinds of wood — sometimes split, but, in general, mere stems with the bark on, sharpened sometimes by fire, sometimes by stone hatchets or celts, and, in later times, by tools of bronze, and probably of iron — were driven into the shallows of the lakes, provided they were not rocky, at various distances from the shore. These piles were placed, sometimes close together, sometimes in pairs, sometimes tolerably wide apart; generally in regular order, but occasionally in apparent confusion. In all cases, the heads of the piles were brought to a level; and then the platform beams were laid upon them, which, in some cases, were fastened by wooden pins; in others, mortises, or central hollows, were cut in the heads of the vertical piles to receive the cross-beams. . . . The platform lying on the top of this series of piles appears in many cases to have been of the rudest construction, and to have consisted merely of one or two layers of unbarked stems lying parallel one to another. . . .

"Some few of these dwellings appear to have almost touched the shore; but this is not a common case.

Most of them, as before mentioned, are at some little distance from it; and in all probability they were connected with it by a narrow platform or bridge formed also on piles. In some lake-dwellings the remains of these bridge-like entrances have actually been discovered." *

Can psychometry call up these lake-dwellers? Can we discover who were their progenitors, and of what race they were? Can we learn the condition of the country when these dwellings were reared, and discover why these people chose such singular places of abode? Can we see their daily life, discover their religion, learn how they were governed, and where they buried their dead? The knowledge we have obtained has increased our desire to know much more, that no relics hitherto discovered have been able to give.

I obtained, some years ago, a hatchet of greenstone, and a handle of deer's horn, which were found in the vicinity of Concise, Lake Neufchâtel; which I supposed would probably present to the psychometer some details of the life of this remarkable people, and inform us with regard to what, without the aid of psychometry, we might never learn. Nor was I disappointed; though much that was obtained was entirely different from what I had anticipated. The first specimen tried was the deer's-horn handle, which was examined by Mrs. Denton in 1864; she knowing nothing regarding it, except what a sight of it might have afforded.

* Keller's Lake-Dwellings of Switzerland, pp. 3, 4.

"I see very large jaws, much hollowed in the middle. There are sharp-looking teeth in them.

"Here is a place where the water comes up into the land. I do not know its character exactly; but there is water here. There are hills back from the water; and a large stream comes down between hills to this place. I see a group of mountains (1).

"I feel human influence about it. There seems to be a small village at the foot of the mountain. The ground is high where the village is."

Second examination: —

"I see a very large bird. It seems as tall as I am, or nearly so. It has a long bill, — just the thing for catching fish. It is in a marshy spot (2). (Now I see all objects in miniature.)

"I see a human being on an animal. It looks like a picture. The animal has a bushy head. It looks like a horse, but differs from all that I have seen. It is not more than half the size of a common horse. It is quite symmetrical, and very nimble; and has a very frowzy head (3). The man is small, — dwarfish. His arms are down, holding to it. He seems to have nothing to guide it with, and is clinging to it. I see a reddish-colored band upon his body; but, whether he is clothed or not, I cannot say. There are animals here resembling elks (4).

"I have a sense of wild persons around here. Now I see three together, all sitting in a similar position. They are women. One has a baby, — a little round-faced thing. They seem to have been out together, and have stopped to rest. Two of them are carrying something between them. I think

it is a dead animal. They have a greasy, yellow look, something like Indians. They are short and thick-set. They have something thrown over them: I do not know what. They resemble the thick-set people that I once saw with an English specimen:* they resemble them in looks and spirit. They must have lived long ago."

(1.) Lake Neufchâtel, where the specimen was obtained, lies in the midst of the Jura Mountains. Her description does not agree with the situation of Concise: no stream flows into the lake at that point, though there are several at other points.

(2.) This was probably a variety of the crane, or heron, both of which were common in the neighborhood of the lake-dwellings.

(3.) Two species of the fossil horse have been found in Great Britain, — the first about the size of the common horse, and the other about the size of a large ass. It differed from the living horse in the more complex plications of the enamel of its molar teeth.† The horse of the bronze age in Denmark, Italy, and Switwerland, was smaller than the living horse, and had a larger head in proportion to its size. The difference between the small horse of the prehistoric times and that of the present was, of course, much greater in its living appearance than any examination of its skeleton would indicate to a naturalist. The animal seen may, however, have been an ass, which Mrs. Denton has never seen.

* Soul of Things, p. 212.

† Chambers's Encyclopædia, art. "House."

(4.) Remains of the elk have been found in the caves of the Dordogne and in the lake-settlements of Switzerland.

This appears to have been at a more ancient time than that of most of the lake-dwellings. The Concise settlement is believed to have been one of the earliest; but I think there were settlements on or near these lakes much earlier than the Swiss archæologists suppose.

About a month afterward, Mrs. Denton tried the hatchet, still knowing nothing of the history of the specimen; nor did she know that this specimen had any connection with the previous one.

"I get the influence of human beings, — of savages, or uncivilized people. They seem to have lived long ago. (What I get seems to come in pulsations.) Now I see one, — a male, I think. He has very long hair, which comes down over his face, straight from the crown. It looks very bushy, and matted on the top, as if he had been in the habit of carrying something on his head. It is evident that he never combed his hair, except with his fingers. His face is quite round. There are several more; but I cannot see them distinctly. His color is darker than tawny, — brown, or between drab and dark-brown. His hair is dark, except the spot I noticed in front, which looks gray. He seems to have carried flesh on his head; and the blood and fat have matted the hair together.

"I see one now that sits more like a monkey than a man. His feet are on one limb of a tree, and his

hands on another. He is swinging, and looks very monkey-like.

"What this people undertook they pushed through, dashing along without a great deal of thought.

"There is water here. It is deep too. It seems to come in here from some other body, round the rocks, in a kind of bend.

"I see that man stooping over, and pulling at something on the water, or above it. It seems a kind of platform. He is pulling with all his might. I fancy he is trying to move it, — to start it."

In answer to questions: "They have chubby faces. I see no hair on them. They are not as far back as some that I have seen. They seem about half way between us and them."

She probably refers to human beings seen in England, an account of which is contained in the first volume, Experiments 80, 81.

Two months afterward, the same specimen was tried by Mrs. Denton again; she knowing nothing of its history, or of her previous examination of it.

"What a difference between the artificial age of this and the real age! I thought that it was bone; but I learn from this that it is not.

"I see something artificial on the water. It seems made to walk on. I see some huts made of poles, with skins. They are rather shelters, perhaps, than huts. They are put up in such a way as to come together at the top; and a covering is spread over, leaving a space for a door. There is another kind, with different poles set up, and covered on top, with

the sides open. One may shelter in warm weather, the other in cold. (That is my thought.)

"I seem to go to a place where I have been before, — where the water comes into the land; a high ridge on one side, and then low, where I saw persons on logs getting something out of the water. It *is* the same place. The trees are the same, and every thing. It just seems as if I should see those men, if I could get round. It is a large body of water (1). I can feel the influence of those people all about here. I see two of them near a tree. They are sitting down. I see one of a different kind, — long-limbed. He is jumping. They are dark and hairy. There is a log lying down; and they sit astride of it. No: they are trying to shove it along, astride of it, and steadying and shoving it along with their hands. There is a good deal of fun about them. No ideas of housekeeping here. They look very filthy.

"One of them is taking up something: it is a woman, who is reaching over, with arms stretched out as far as she can. Something hangs down over her back. They wear nothing on their heads. They care for food and shelter, a place to squat in: that is all. The others seem to be controlled by them. The lighter-colored are masters, and the others slaves, I suppose. At all events, they are controlled to some extent (2).

"I see some animal that is tame. I see several, but not distinct enough to describe, they seem so misty.

"I am some distance inland now. I see a group of persons, with animals, near water. I see an animal

that looks like a dog. It is long, and rather large, — longer than our dogs; and differs from all I ever saw. It looks more wolfish (3). The dogs are numerous. I see four fastened together. I think they use them for drawing. They are dark colored."

(1.) Lake Neufchâtel is twenty-four miles long, and four broad.

(2.) Here are two races, — one round-faced, and doubtless round or short headed, comparatively light-complexioned; and a much darker, long-limbed, long-faced, and doubtless long-headed and more barbarous race. Remains of long and short headed people have been found in ancient deposits in various parts of Europe; and, in some localities, they seem to have been contemporaneous.

(3.) Prof. Rütimeyer informs us, that, during the early stone period in Switzerland, a domesticated dog, of middle size, existed, which in its skull was about equally remote from the wolf and jackal.*

These examinations appear to point to the commencement of the lake-settlements.

SWITZERLAND IN THE EARLY STONE AGE.

Four years afterward, Sherman examined the greenstone hatchet, and saw and described a people more advanced than those seen by Mrs. Denton, and yet, I think, farther back in time. He sees neither horses nor dogs, but describes extinct animals, and gives indications of a warmer climate than could have

* Darwin's Animals and Plants under Domestication, vol. i. p. 51.

existed in Switzerland during the recent stone period or the time of the lake-dwellings, judging by the remains hitherto discovered.

"I see a river and a hill on one side of a village." ("Go back in time.") "I see it. The river is larger, and the trees are different; but the hill is there. There is a large bird, with a bill larger than its head a good deal: it feeds upon a grub-worm. I see a bird with a bill that hooks over: the lower part is short. (I open my eyes; and I can still see the outlines of a bird where the stone is.) I see a very large crocodile that feeds upon fish."

("Come to the human period.") "I see a very low class of men: they are trying to catch a large turtle. There are six of them. They stand on its back. They put sticks before it, and try to turn it over on its back; but it pushes the sticks away. It is hurrying to get to the water: it is about half a mile from it. What large tracks it makes! It is low ground. They have all jumped on its back, and are getting a ride. It does not bite any, but makes a kind of hissing noise. They can't manage it. There is a lot coming now: they are yelling. The turtle runs as fast almost as the men. The others have clubs: they are after it. Now they have all got there, and are making it go back. They put their sticks in the ground in front, so that it could not go forward. It stops, and will not go back. Now they have turned it over on its back: it is wriggling and scrabbling, and trying to get over. Well, I declare! it has got over while they were laughing and talking. It is going for life. They are pounding and hitting it on the head. It has got hold

of one man's stick, and will not let go. They have turned it again; and they hit it on the throat, so it cannot turn over. They are trying to carry it, — two at its tail; others hold its paws; and others have sticks under the shell, and are carrying it.

"They have come to a place where there are sticks driven down all round, and sticks go from them to a peak, and broad leaves on them so as to cover it all over, — a nice shelter from the sun. It is a very large house, or rather two joined by a kind of entry. They have some turtle's eggs. (Some other men came in with them.) They are large and round, — as large as a big apple. They are the eggs of that turtle: they dug them out of a sand-bank with their fingers and nails, like a dog when it is digging after a rat.

"They have smashed the turtle's head with their clubs. They have sharp stones, and cut the flesh off all round the shell. It is alive now, and switching its tail round. There are lots of the eggs in it yet: they must have disturbed it before it was done laying. (I see tracks all the way from the nest to where they found it.) They have a kind of canoe, or trough, about ten feet long, and three feet wide: they are putting the flesh and eggs into that. It is pretty smooth inside. I only see two or three places where they gouged it in hollowing it out. They throw away some parts that are dirty. They washed that big dish before they put the flesh in. (They are more particular than one would think.) They are taking out a lot of yellowish-looking fat: they keep that. Now they are taking out the red flesh. The shell is very smooth and perfect, but green on

the outside They cut round the shell outside, then cut the legs, and just slipped the skin right off. They throw out pieces; and a lot of little animals about the size of a cat come round and eat them. I don't know whether they belong to them or not (1). They are scraping the green stuff off the shell, and washing it. It is very thick, — more than two inches. It is soft on the outside; and they are scraping and digging into it with sharp stones. They have made a dish of it now, and are putting the eggs into it. They have set it on the ground, and are sitting round, and eating out of it. They have some kind of plant that looks a good deal like celery: they chop it up with the eggs, and then scrape it out with their stone knives and eat it.

"Those that are not eating are fixing the flesh to roast. They put it on the bare coals, and every now and then run sharp sticks into it to see if it is done: when it is, they put it into another turtle-shell that is dry and very hard.

"Now those that were eating the eggs are done. They bring in water from a spring near in a little trough, and wash the shell out clean: it is white inside.

"Another lot are coming to eat, — women and men. They have something white round the middle: it looks something like cloth, and reaches from the breast nearly to the knees. The hat is a broad leaf, dry, and bent over, with a stick stuck through it all round, that holds it in place. (It is light as day there, and so dark out here!) They put the fat in a kind of skin that they took out of the inside,

and lay it upon the coals, and fry it. It blazes a good deal, — more than the other did.

" Two of them are making hats : one came in with a broken hat. They bend the leaf first, then put sticks through it, and then dry it.

" The fire is nearly out, and they are putting on dry sticks that they pick up in the wood. They cook every thing but the eggs. (It seems as if I could seize every thing there. They don't seem to notice me.)

" I went into the other room ; but there was no one there. It is a kind of parlor. There are seats made of sticks, with leaves spread on them. One of those turtle-shells is there, smooth and white and nice : all the green stuff is scraped off.

" I'll see where they get those green plants. There are lots of them growing near. Two of them are gathering them : they snap them off near the root. They carry in armfuls.

" I see another turtle-shell hanging up : I did not see it before. Those last ones had some meat, an egg apiece, and some of those greens. They let them dry a little before they eat them. They are sour.

" A great animal ran out of the bushes after those two that went for the greens. They have run back for their bows and arrows. They have all got them now. They are after it. They have all shot at it. There are, I should think, twenty arrows sticking in it. They have lots of arrows in their hands. It is bleeding, and rolling about. I think it is a tiger : it is spotted." (" Probably a leopard, then ?") " Yes, a leopard. It is dead. They took their arrows out, and

are carrying it home. They are skinning it. They wash their stone knives first, and push them between the skin and the flesh. It comes off so nice! They have washed it and scraped it, and put something brown on it, and hung it up.

"They don't touch those cat animals that are round here: they have eyes like a cat, and mew like a cat. They don't come very near, — only two or three, more tame than the others.

"They are cutting up the flesh of the leopard into strips to cook. Is leopard's flesh good to eat? The fat they take to grease the strings of the bow: they grease the arrows too, to make them slip. There is a little notch in the bow where the arrow slides through. They hang up the meat that they don't want on the poles.

"Many days have passed now. They have taken the skin down, and put it on those seats to sit on. They are real neat. They clean themselves before they go into that better room. When their hands are greasy and bloody, they wash them: they are very particular. Is that one of their stones?" (looking at the specimen.) "It looks very like one: I did not know what it was. They are not lazy. They have lots of those leopard-skins. I did not see them before: they had them in one corner, in a kind of closet.

"In the daytime the hut is all open at one side, except a few places; but at night, before they go to sleep, they have doors made of leaves, with sticks to strengthen them, that they set against the side, and make it all tight. They have marks on them, and on

the side of the hut, to show where to put them. Then they lie down on the furs in that parlor, on the ground, with dried leaves for a pillow. Oh, what a snoring they make! The wild animals outside are howling, and trying to get in. It took them about half an hour to get those things all right: they were more patient than many people are now.

"Men and women all sleep in the same room: they lie in rows. I see some boys and some babies with their mothers.

"One of the men heard an animal howling near his head. Its nose is against the door, and is bending it in. The man has wakened some of the others; and they have got their arrows. One — a chief, I think — tells them when to shoot, and they all shoot together. What a howling there is outside! They hit it. Now I'll see what they do. Why, they don't go out! they all lie down again, and go to sleep.

"They get up very early, — before the sun rises. That animal lies there: it is a leopard too. They are dragging it in, and skinning it the same as the other. They have found all their arrows but one. The sun is just peeping.

"The fire was not out: the women are fixing it. They are frying the flesh of that animal for breakfast. I guess they relish the turtle better than that leopard. They put turf on the fire to burn, and use the ashes to put on the skins.

"They are not white people, but brown; as dark as Indians. They have a large back-head, and the forehead is low; but they know a good deal.

"They always prepare for the next meal.

"I see one dead. They look sober, and real sorry: none of them laugh. They dig a place with sticks and things, and bury him. They stay round a while, and then go back.

"A party has gone to the brook to look for turtles. They have found some large eggs, — a good deal larger than the others. They are digging for more. They have got twenty-two.

"What they wear is skin with the hair off, scraped till it is white. That chief is dressed up pretty in pieces of furs that come down to his ankles. The furs are spotted white and black. He has lots of quills and feathers in his cap. It is the prettiest one of the lot. He has beads on too: they are as large as the end of my finger, and white.

"When one is sick, they are very good, and hunt the forests over for something for him to eat. The hair is long, and black or dark, — the women's longer than the men's; and some of them have hair that is curly or frizzly. They are stout, broad-shouldered; and the eyebrows stick out far.

"That river goes out to a lake that I cannot see across; and oh the turtles there are there! It is not far to it: they might go there and get plenty to eat. They always take sticks with them. They don't eat their meals regularly; sometimes only once a day, and some days four times.

"There are many birds in the lake. I saw a butterfly then. I think it is a lake: it is not salt. I see a little point of land on the other side: it looks blue (2). When any one walks along, the turtles dash in, and stick their heads up, and look round:

they are much afraid. Those cats follow them to get something to eat."

In answer to a question: "The leopard was about as large as Jeff" (a Newfoundland dog).

The advance of humanity upon this planet has not been, in my opinion, a steady progress from the beginning: wave after wave has rolled along, some falling far short of their predecessors, but eventually followed by others that advanced beyond all previous bounds. Portions of North America had been occupied by races in some respects in advance of the occupants of the country when first discovered by Europeans; and so portions of Europe, I have no doubt, were occupied by races, at a very early period, far in advance of many that succeeded them in the same localities. The stone age was an immense period; and it will take us long to work out the history of the various races that crossed and intercrossed before historical Europeans had an existence.

(1.) Probably one of the first steps in the domestication of the cat.

(2.) His description does not agree with the present condition of the Neufchâtel Lake.

THE SWISS IN THE STONE AGE.

In 1872 he tried the same specimen again, and found a similar people, but under somewhat different conditions. He did not appear to remember his previous examination; nor do I think that he recognized the resemblance of the people described with those previously described.

"I am inside of a very long house; but it is narrow: it looks like a rope-house. People are sitting on each side. The women have their hair done up in a knot on the head: the hair is drawn tight all over but there. There seems to be some ceremony going on. The men are on one side, and the women on the other. The women's arms are folded; and the men have their hands on their knees. Nobody says a word, nor makes a movement: they do not even look at each other.

"Just now a very large man came into the house, dragging a turtle with a rope; but the rope is a piece of a root. He saw what they were doing: said nothing, but went right out. He is standing outside, and trying to see without being seen (1).

"They look as if they were waiting for spirits to influence them. Now a woman commences to talk, and talks with her eyes shut, and stamps with her feet, and makes motions with her hands: she seems very much in earnest. They are listening, and all looking at her. It seems as if she were in a trance, or a spirit was influencing her. The man outside is wonderfully interested: he is peeping and listening.

"Now she is going round to every one, and telling them something, and shaking her finger at them; but her eyes are still closed. They are all laughing hard now: the man outside laughs too. She stops a long time at one man. Now and then she hits him a tap on the head, and they laugh. He is very much excited, and is shaking.

"She opened her eyes, and went back to her place. She looks very much ashamed (2).

"The man that was outside walks in, with his turtle by the tail; and they are all laughing. The woman was crying; but she laughs too now.

"This large man has to stoop. Things are hung up, and he hits them, — clothes that they wear out of doors.

"At one end is a low place, with beds in it. At the end of that is where they eat. This is a pleasure-room for dancing, and so on.

"I see a number of turtle-shells where that man went. The turtle he has is alive: it is the largest that has been caught.

"Their beds are not more than a foot high; but they are very wide: five could sleep at one time. The three rooms are divided off.

"There are woods on the right hand of the house as I stand, and a great plain at the back of the house, and a path going that way. They have bow-guns and arrows: they keep them in a corner of the room."

("What are their clothes made of?") "They seem braided out of grass; but they are very neat.

"They have got through with their meeting, and seem to be going out on a hunt. They are getting their arrows and things. There are a great many little children here that I did not see before. Several boys are going with the men: they have little spears.

"They are going to a lake. There are canoes, and they are getting into them. They are after fish. They have a curious way of getting them: they throw out pieces of meat; and the fish come up to eat, and they shoot them. They have very large bows and arrows for this. One that shoots is in the front of the canoe: one in the middle paddles; and another shoots at the

back end of the boat. They are careful not to miss: they don't want to lose their arrows. They are fine-pointed, — bone and stone. The arrow has only one barb: most of them are bone. The boys are going round the edges, getting what have been killed that the men did not catch, — some that died before.

"One man shot a little one, and threw it back: up came a big one, and swallowed it. Two men shot at it; but both missed it, it darted so quickly. How provoked they were! They stood up in the boat, and held up their hands.

"The people are long-faced. The men have a short beard, coal-black. Their complexion is brown, or a yellowish-brown."

The same specimen was examined on the next evening.

"I am in a mountainous region now, or somewhat mountainous. I see some very large birds sailing round at a great height; but I see no people." (Long pause.)

"All of a sudden it changed; and I am very nearly where I was last night. It just seemed as if somebody had let down another scene.

"I see a great many savages going through performances, — dances. They have on curious hats, of a conical shape, made out of bark. They tumble off as they dance round. They cover their eyes. They look very comical when they lift up their heads to see any thing. They are making all sorts of noises; but they keep step in their dances.

"They have in their hands something like fans,

made of wood, with skin round the edges, and little tassels hung to them. They have belts made of birds' plumes. They are not like the men I saw before" (the previous evening). "These are plump, large, and round-faced. They seem to have immense strength. The others were slim, with long faces (3).

"The men are all good-looking, pleasant, and smiling. Some are beating with sticks to keep the time for them. They make horrible screeches. The sound is very clear, — not hoarse or gruff, but more like the sound of a woman's voice.

"They are on the bank of the pond. The ground is very well trod; very smooth, like a path.

"These men, in their dances, come together like two roosters, as if they were going to fight; and rise up to each other, and then go back again.

"A few women are sitting down and keeping time: none of them are dancing.

"They are wrestling now, and trying which is the strongest. Two of the strongest are trying now; and the rest are looking on and laughing. They are very muscular, and considerably darker-complexioned than those I saw last night.

"I see another gang now that have come in from hunting. One of them has a fawn on his back, which he holds by the feet. It seems to have been caught in a trap. There is a mark round its neck, and I cannot see that it is wounded anywhere. They are skinning it now, and fixing a place and getting sticks for cooking it.

"They make a hole in the skin under the throat, and then, with a stone knife, rip it down, and pull it

off with their hands. They wash the blood off in the pond. They are quite clean, — about as clean as people are now.

" They have a fire already. They have two forked sticks, and fasten the feet to a pole, and let the body hang down from it after it is laid on the sticks. They do it very quickly, there are so many of them. The neck of it had been broken.

" Oh ! they have another one cooking a little way off. This is a good deal larger. (They save the skins.) They are looking on as if they were hungry.

" There is one very fat man here : he can but just waddle around. (Night is coming on now.) He seems to be the chief : he orders the men round. He has feathers on his head, fixed to rattan or something of that kind, — rows of them over his head.

" They have a great many ornaments on their arms and legs, and in their ears and noses ; some made of ivory, I think, and others of bone.

" They have one fawn done ; and the chief is helping himself, and tossing a rib now and then to those around. There are some women behind him, and he tosses some to them occasionally : they generally catch them.

" I saw one man squatting down ; and a man behind him reached between his legs, and stole the rib he had laid down to cool. The chief has a stick, and hits them when they don't behave. I saw him hit one man who took a rib that he intended for another.

" They are eating the other deer just as they please, and having great fun. Some are away off, and seem to be keeping guard. Most of the women are at the

other fire. Their eyes shine just like cat's eyes. Perhaps it is the light of the fire that makes them look so.

"There are huts near here; and the people keep running back and forward between the fires and them. They are built by fastening limber trees together at the top. They are regular wigwams. There are lazy fellows sitting round in them. There are skins on the outside, and skins for carpets inside.

"I think that chief has several wives. I notice that several women accompany him, and wait upon him."

In answer to questions: "They had not much clothing on, — a skin round the middle, with the hair hanging from the lower edge for ornament. The dancers had bands of skin round their arms, with the hair hanging from the lower part."

(1.) This could not have been a regular meeting, held at a stated time, or the hunter would have known of it, and avoided disturbing them.

(2.) This description fits almost exactly that of a modern trance-medium. Can it be possible that mediums of this description existed thus early?

(3.) The two races previously seen by Mrs. Denton appear to be here noticed and contrasted.

WINE-MAKING IN ANCIENT SWITZERLAND.

With a fragment of the deer's-horn handle he obtains another view of the primitive people of Switzerland at a time somewhat more recent, if we may judge from the baskets and earthen jars that were in use, and the fermented liquor.

"I am in a rather mountainous place, and on the

bank of a river. I see a great many people picking a kind of black berry that grows on bushes. They are brown people, as dark as Indians. Others are coming over the river in a boat to the place where the berries are. (The boat is a miserable thing, — burned out.) They gather them into very large, flat, shallow baskets made of willow. They look very strong. Two persons pick into one.

"They have a kind of press to crush the berries in and squeeze the juice out. It is something like a lye-frame. Sticks that are grooved come together at the bottom, forming a press in the shape of the letter V. A lot of fellows are on top, stamping with their feet; and their legs are red up to their knees. (The fruit is black; but it has a red juice.) I see them pull slivers out of their feet. They have earthen jars to gather the juice all along the bottom. It runs in perfect streams. They seem to have a jolly good time: they laugh and halloo.

"I saw one fellow drop some pressed berries upon an old woman that was tending the pots. She threw a handful of berries back at him. She is very angry.

"There are several presses here for squeezing out the juice.

"The berry is about three times as large as a huckleberry, and something like it in shape. It is puckery, and I do not like it much. I think they must make some kind of liquor of it. They are not drinking it. I think they let it stand and ferment.

"I can see their houses on the other side of the river. They are lugging the liquor off to them.

"Their houses are round, with conical roofs, and covered with a kind of thatch (1).

"It is to make liquor. They have it in large troughs, standing in the sun; and I can see the foam on the top of it.

"I see many rabbits round the houses, that seem to be tame (2). There is a kind of spotted wildcat, as large as a terrier-dog. It is rubbing itself against things, like a cat. It is watching very attentively some small birds on the thatching, as it stands on its hind-legs (3).

"There is a tame bird on a perch, — a green bird with a long tail. It looks like a parrot, and has a thick bill. It turns its head round as it watches the cat."

("What is in the house?") "There are seats all round (kind of benches), and a great many furs, — piles of them. They have been worked like buffalo-robes. Many of them are spotted. One is the skin of an animal like a cow, with long blue tassels attached to the ears. It is all gone."

(1.) There is good reason to believe, that, even during the time of the lake-dwellings, settlements existed on the land. Dr. Keller says, "It is evident, that, at the time when colonies of a peculiar kind had settled down on the shores of the Swiss lakes, the valleys and hills were also scattered over with huts, which were only to be distinguished from those of the lake-dwellers by being on dry land instead of standing on piles." * He also says, "There can be no doubt that the huts of several kindred races on the mainland were in many cases circular;" and he refers to Strabo, who says, "The Belgian Gauls make their

* Keller's Lake-Dwellings, p. 312.

huts spacious, out of boards and willow hurdle-work, dome-shaped, with a high roof."

(2.) These were probably hares, remains of which have been found in the *débris* of the lake-dwellings.

(3.) Many species of the cat family have doubtless been domesticated by man at various times and in various countries. The bird was probably one of these extinct forms that perished with the change of climate.

LAKE-DWELLERS OF ROBENHAUSEN.

But, in all these cases, nothing, or but little, of what could be attributed to the genuine lake-dwellers, appeared; but some time afterward I obtained a small piece of pottery from Robenhausen on Lake Pfeffikon, which Mrs. Denton examined, knowing, as usual, nothing of the character of the specimen.

"I see the skeleton of a large crab or lobster. Now two men upside down: they seem like the men of the present. This seems recent, — almost new. They are looking at something suspended before them. Figures flit before me so fast, that I cannot separate them. There seem to be many things here; but it is difficult to distinguish them. I see a high rock in the distance.

"Now I am beside a stream, — on the bank. At a little distance there appears to be artificial work. I see an old man bent over in a kind of house, sitting on a seat or bench: it is a rough affair. A shadow of a man comes up every now and then that I cannot see through.

"I see long, rounded sticks, smaller at one end, like javelins. Several of them stand up at the side of this room, or whatever it is. (I do not see it all.)

"There are, I see, a row of buildings. They are huts; not high; but they go up straight, and have slanting roofs. They are in the form of two sides of a square: I do not see the other two. They are three or four times as long as broad.

"I see something like a canoe on water, and men in it. There is a marshy kind of place here. There is a long string of buildings, — more than I saw before. I seem to be on one side where I can look at them. Some of these people have curious wrappings on them: they seem to be wrapped up rather than clothed.

"Now I am inside of one of the buildings. There seems to be something over the top that is heavy. There are what look like benches to sit on. Some of them seem very much pleased at what one was telling. Yet I do not see them: I feel it in the room. There is something active about them, rather eager, as if, when any thing was agreed upon, they were in a hurry to do it. Some of them have a home feeling; though, in some respects, they are brutal. (I sense better than I can see.) When things go to suit them, they are quite cheerful; so much so, that they seem childish: they give way to their feelings. They lack judgment. A bright day, or any success, makes them hilarious. A dull day makes them sad, unless things go well in other respects in their houses. They have few things to do with, considering what they accomplish (1). They have a good deal of

energy, and calculate about making and changing things, and manifest a good deal of skill in their tools: they adapt them well.

"Their canoes are wonderful, considering the tools they use: they look well on the water. I do not know how they build such houses. There is something heavy on the top. There are a great many poles about their buildings. There seem to be poles on the roof, something over them, and something over that.

"Their houses are all near each other, in a row, — community fashion. They seem very intimately connected with the water in some way. I do not know how it is. They seem to live on the water, or in the water a good deal. They are in their canoes much, and must get a great deal of their food from the water: perhaps that is it. That must be a place for fishing.

"They are pretty well advanced in making bridges from places in the water to those on the land. Their bridges are very peculiar.

"I see a long place on the water, where they live. Sticks are driven down thickly for the houses to stand on; and there is a road made in the same way from that to the land, and pieces of wood hewed off, and laid down to walk on: but in some places the sticks are driven down near enough to walk on without any thing more (2).

"I see large piles of wood — poles and slabs — on the land, that they seem to be preparing to take out in the water: the boats are fastened near it, as if ready to be used. I think all the houses I saw must have

been on the water. The people are large-featured, as a general thing.

"They are older than Pompeii" (compared with a specimen from Diomed's Villa): "they are older than this too" (Theban *shabti*, previously referred to).

"There is a mountainous region not far off (3). I can see them roaming through the mountains; or, rather, I feel the influence of them. They are hunting some (4).

"They seem to do considerable business on the water: the water is their home. They seem to look to it, bright and cheerful, when they are among the mountains.

"It seems strange that such strong and advanced people should make their home on the water (5).

"There is a narrow strait that goes round a bend in the mountains, and connects this with another body of water where there are more people. There seems to be a connection between the two: the people go back and forth. The others seem nearly at the extremity of the body of water (6).

"There is a place near that strait where they do something.

"The people are very much alike in the two places, and they unite for some purposes. There is a good deal of friendly feeling between them; and I think they are the same kind of people.

"There is rock on one side of that strait, and I don't know but both sides, high up from the water. It seems a difficult place to get at; and yet they go there for some purpose.

"One of these settlements, the last, seems considerably larger than the other. I think that must be the older. There is more valley there too: it does not rise as abruptly from the water.

"It seems as if they carried their dead up to a cave, partly natural and partly artificial, in the rock near that strait (7).

"These settlements are connected away off with some town on the land, or on some body of water away off. It is near water, at all events. That is a larger settlement still. I think now that it is partly on the land. They have come here in their boats in the first place, I believe, from that other place (8).

"There is some taste and fancy about these people.

"There seems a lack of the female element here. There are some women, but not as many as at the older settlements.

"This is higher up in the mountains than the other settlement.

"They are rather coarse-featured people. There is considerable refinement of feeling about them in some directions."

HOW THEY DISPOSED OF THEIR DEAD.

"I get the impression that they wrapped their dead closely in some kind of cloth, and laid them in that cave in the cliff, fastening up the entrance. They must have gone up with a ladder; and it seems to me that one person must have carried the dead bodies up. There are piles driven for the ladder to

stand on, and planks over them. The dead body seems to have been strapped closely to the carrier's back, but so done that he could unloose it when he got up there. The rest are in their boats at the foot of the ladder, waiting till he comes down. There is no useless ceremony or parade; no mourning for the sake of show. It seems remarkable on that account. I do not see this as clearly as I saw the building. There seem to be about a hundred men in this settlement."

A second examination on the same day: —

"I see it again. Their dwellings are plainer to me than objects in this room. I see flashings of light from the water on the buildings.

"I wonder if there are natural caves around there. There is a very large smooth rock in one place.

"These people have a good deal of physical power, I think.

"Some of the houses are woven with branches, — woven in between upright poles.

"They actually have places for their animals on those piles (9). Their houses are separate; but they are on the same platform. I see cows and horses that seem smaller than ours. They have domestic animals for milk and labor. I see goats (10). This place must have cost them an immense amount of labor. It must be of more recent date than I thought. What I see indicates considerable intellect.

"Their women seem more confined than the men The men are rambling about more. The women take care of the animals at home. They have something like the hound, that goes with the men a good deal.

"It seems as if I could almost get their language. I can hear them talk. I won't say that I can hear, but sense. It is a kind of chittering: it is difficult to express. The sounds are made by the front part of the mouth, — labial and dental sounds: guttural sounds are not common."

THEIR WORSHIP.

"There is some sensation of their going up high to worship. I think they meet from both settlements for that purpose. They go up into one of the mountains, and nearly all go together. I think the place is so near, that they can go and return in a day. They have a kind of chanting connected with their worship; and they manifest considerable enthusiasm in their chanting. It seems to be on the top of a mountain or very high hill, and in the open air. I think they go only when the day is pleasant; and there seems to be quite an interval between one visit and another. I do not think they remain long. The chanting is done in a circle, moving round and round. There is some other ceremony, something like dancing, connected with the chanting and in the circle. They do not use their arms much, but throw their feet out. I think there are several of these worshipping-places through the country: other settlements have theirs. I do not think they had any priest: it seems to have been a mutual thing (11).

"What could have induced them to live on the lakes? There is plenty of other land, and *even* land too.

"They seem to be a very industrious people. Their features are well arranged, symmetrical, but large. Their heads are rather sloping. The skin seems thick and firm, coarse, but close, and as fair as among our people who work out of doors. The skin of the women seems a good deal like that of our men. The hair is darkish, but not black. The women have long hair; but the men don't seem to have. I wonder how they cut it. The men have a bristly look; but their hair is not matted and tangled like that of savages. There is something tidy about them, considering the way in which they live.

"They seem more like us than any ancient people that I have seen psychometrically. They laugh very heartily, and altogether they seem a good-natured and genial race. There is a little timidity about them too: they would shrink from an enemy rather than attack him, but would fight to the death if attacked. That is, probably, the reason they go together so much. But how they do seem to thrive on that water! They seem perfectly at home there.

"I see an ox that seems a little different from ours. The anterior portion of the body is heavier in proportion, and the animal more shaggy. The head hangs down more when standing. Taken as a whole, I question whether it is as large. The goats are very similar to ours; perhaps a little larger.

"They went above the timber-line on the mountains. I can see for a great distance.

"They seem somewhat fearful on the land, and as if they felt more safe on the water I sense it in the women in anxiety for the men when they are away.

The feeling seems to have somewhat died out. It is like the feeling among the settlers on our Western border in reference to the Indians.

"As a whole, they are superior to the Egyptians mentally. They have not as many barbarous ceremonies, and there is more individuality manifested. There is a good deal of consideration for the feelings and opinions of others. Each one seems to be allowed to take his own way; but there is a continual warding off of some exterior influence. The women are particularly independent. They work with the men, and calculate with them. There is much equality among them, that seems to be the result of thought; and it seems as if they contrasted themselves with other tribes and peoples in this respect (12). They seem, also, to feel superior to their surroundings: they feel that they lack what is essential. The women seem to feel it sensibly.

"There is a good deal of bravery in feeling, but a lack of power. They have a great deal of determination. They seem to have very strong voices: they use them a good deal, and I hear them a long way off.

"I believe it is a foreign foe that they are in dread of: something came up then that seemed like it.

"I see quite a large place enclosed, — a circular mound, surrounded with stakes. It does not seem to be where the dwellings are, nor on the land adjacent. There is a mountain near, — a volcanic mountain, I think. It seems to be a volcanic region: it is a warmer climate. There is some thread of connection between this place and the other. This place is near the sea. It seems to be Italy, or near it.

"I see a chain of hills that rise into peaks. I can see the sea from the peaks. I feel an influence, back and forth, between this country and the other (13)."

Another examination was made when the specimen was known.

"I see a place where there is just the outline of a settlement, — piles driven down all round. It seems to me, that, since it was left, they are in the water, but not buried.

"I think these settlements were made with small beginnings, and enlarged as the families increased."

(1.) Dr. Keller, after referring to their manufactures of various kinds, says, "All these productions, the result, apparently, of a settled mode of life and of peaceful industry, stand in striking contrast with the wretched implements and tools made of bone, stone, and wood."

(2.) At Wangan, on Lake Constance, it has been estimated that forty thousand piles had been driven into the bed of the lake to support the platform on which the houses rested.

In various settlements, the piles have been found that formed the bridges connecting the lake-dwellings with the land.

(3.) The mountains of Glarus are in the immediate vicinity of Pfeffikon.

(4.) In the older lake-settlements the remains of wild animals are much more numerous than those domesticated, showing that they must have subsisted largely by hunting.

(5.) It is very probable that another and more barbarous race of people lived on the land, of whom

they were in fear; and their residence on the water rendered them more secure, while it rendered their means of subsistence much less precarious, as will be seen from subsequent examinations.

(6.) Fig. 35 is a representation of Lake Pfeffikon, from Keller's "Lake-Dwellers." The narrow strait to which, as I think, Mrs. Denton refers, may be seen at the north end of the lake; and, if this is correct, remains of the settlement to which she refers may be found near the extremity of the lake, where, as yet, no discoveries have been made.

(7.) Keller says, "How the colonists buried their dead is as yet hidden in perfect darkness; for, up to the present time, no burying-place has been discovered in the neighborhood of a lake-dwelling." If they buried their dead in caves, unless something enduring was placed with them, there may be no evidences remaining. I do not know the character of the rock in the vicinity of Robenhausen; but, if schistose, it is more than probable that the cave has become obliterated by the settling-down of the superincumbent mass.

(8.) This probably refers to Lake Zurich, as its situation and size seemed, she said, to harmonize with her impressions; and the two lakes are connected by water. It will be remembered that the first discovery of lake-settlements was made at Meilen, on Lake Zurich.

(9.) An examination of the settlement of Robenhausen had revealed to the Swiss archæologists the fact that cattle were kept on the platforms, and that the stalls were distributed between the houses;

but of this Mrs. Denton knew nothing at the time of the examination, as, indeed, she knew very little of the lake-dwellers.

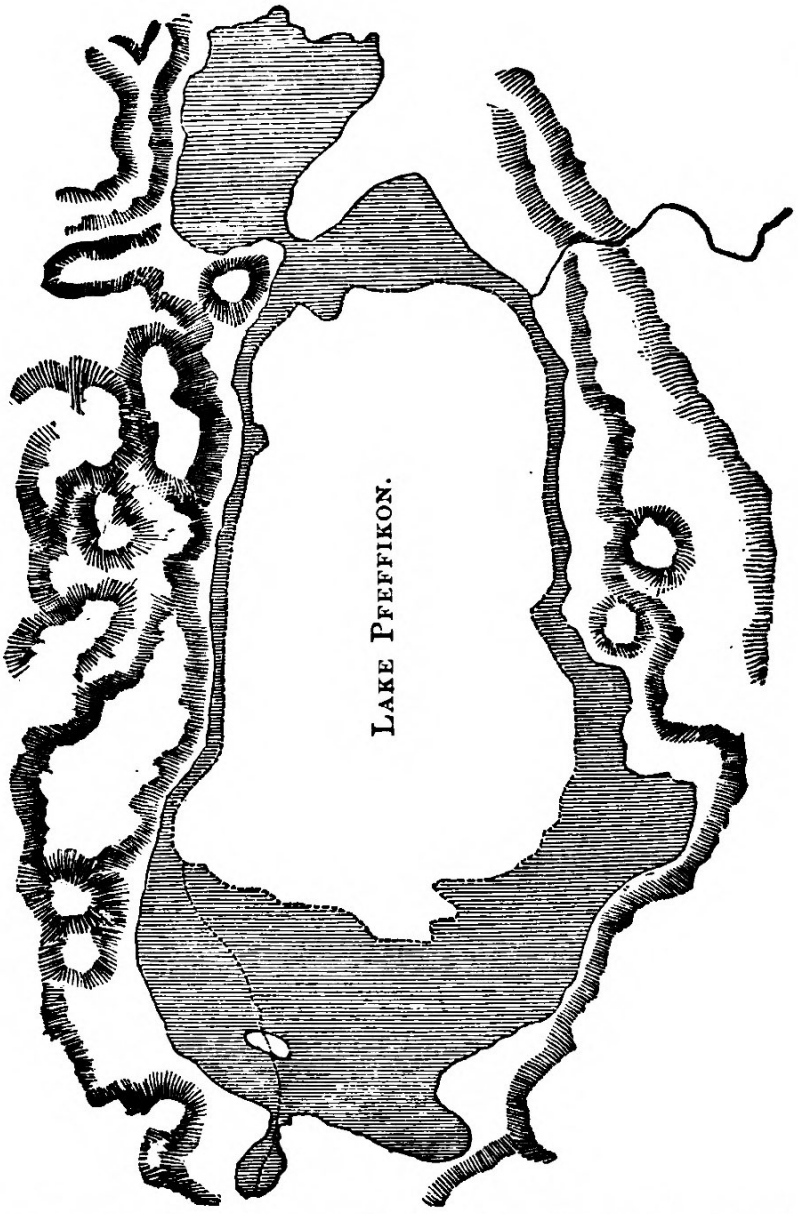


FIG. 35.—Scale 1-25,000th of natural size. The shaded part represents the peat that has formed around the lake. Robenhausen is indicated by the oval space, through which runs a dotted line representing a canal.

(10.) Remains of cattle, horses, goats, and dogs, have been found at Robenhausen.

(11.) Nothing has been discovered regarding their worship, except the fact that various objects of stone, pottery, and bronze, have been found resembling the crescent moon, from which it has been conjectured that they were moon-worshippers. Mountains were selected as worshipping-places, not only by the Germans, but by the Greeks, Persians, and Phœnicians, probably because the worshippers thought them nearer to the object of their adoration. Frequent allusion to this practice occurs in the Bible.

(12.) There was more independence among the ancient German women than among those of any other race with which we are acquainted.

(13.) At the time that this examination was made, I had no idea that lake-dwellings had been discovered in Italy, still less that there was a connection between them and the Swiss; but Keller says, "In spite of some trifling differences, all the weapons, the tools, the lake-dwellings, and even the breeds of domestic animals, indicate a relationship between the inhabitants of the Maniere and the lake-dwellings of Upper Italy with the settlers of the lake-dwellings of Switzerland and the Tyrol, especially of the bronze age."

LAKE-DWELLERS' TOWN-HALL AND TOWN-MEETING.

Same specimen examined by Mrs. Denton. Specimen known.

"I am again by one of those lakes with platforms like those I have seen before; but in this instance

I see a row of cabins extending directly across the platform, from near the edge on one side to near the edge on the other side, the side of one cabin being equally the side of the one adjoining it; and so on through the entire number, there being but four outside walls for the whole number, — some ten or twelve in all. The roofs, also, all unite; and being all of the same width, the same height, and the same slope on each side, they form, in appearance, a multiplied letter *m*. In the centre of each division is a door-way, or entrance, with an opening like a window on each side of it.

"Standing out from these cabins, or dwellings, about or quite in the middle of the platform, is a building much larger than the separate parts of those just seen, and in other respects quite different. This building is square, or nearly so; and the roof projects so as to form quite a shelter outside. It is made of upright slabs, two deep, or as if, wherever the edges of two meet, a third was placed on the seam. This gives the outside surface a rough appearance; though great pains have been taken to make this roughness regular, and, as intended, more for beauty than comfort, both of which are answered by this arrangement. The roof is made of slabs.

"I have an idea that this is used as a house for meetings of public interest; that is, of common interest to the people of this settlement, and perhaps of other settlements near. Possibly there are other cabins on this platform; though I cannot see to the right of this separate building. I, however, sense the extension of the platform considerably beyond this.

"I see quite a number of baskets fancifully colored. There are several on the platform; and some in one, at least, of the cabins.

"There is a large group of persons outside of the cabins, on the platform, — some sitting, some standing. They seem to be discussing some question of common interest; and quite a number, both of men and women, join in the discussion. Others are playing with some children, or listening, as if slightly interested; while a few are talking in little groups by themselves, as if they cared little or nothing about the matter. One man is standing by a high bench or table, and leaning on it. He wears what, I judge, must be badges of honor, or insignia of authority; though I do not notice any fear of him. I do, however, sense a distinct feeling of respect for him; though I am not satisfied as to the reason for this. The badges consist of several diamond-shaped pieces of red and blue and brown (a rich brown) fastened on the outside of his sleeves, and in front of each breast of his outside garment, and so arranged that the colors alternate; the brown occurring at each corner of each badge, and all the colors terminating in points around the sides of the several badges. He is strongly built, but looks kindly. His face is broad, and somewhat wrinkled.

"I feel the influence of two classes of people here, but cannot distinguish their relations to each other."

DAILY LIFE OF THE LAKE-DWELLERS.

While I was writing out the foregoing examinations for the press, I tried Sherman again with the

fragment of pottery from Robenhausen, after he had been trying carboniferous specimens for several days. He knew nothing of the locality from which the specimen was derived; nor did I say any thing as to what I wished from it. The specimen is a little larger than a grain of wheat.

"I am by a large lake (1). It is rather mountainous all round. Some of the mountains are so high, that there is snow on them. I see some a great way off.

"There are many fish in this lake. I see the circles they make. Some jump out of the water.

"There is a smooth rock by the side of the lake, with markings on it that must have been made by people. (Draws Fig. 36.) I think the rock must be

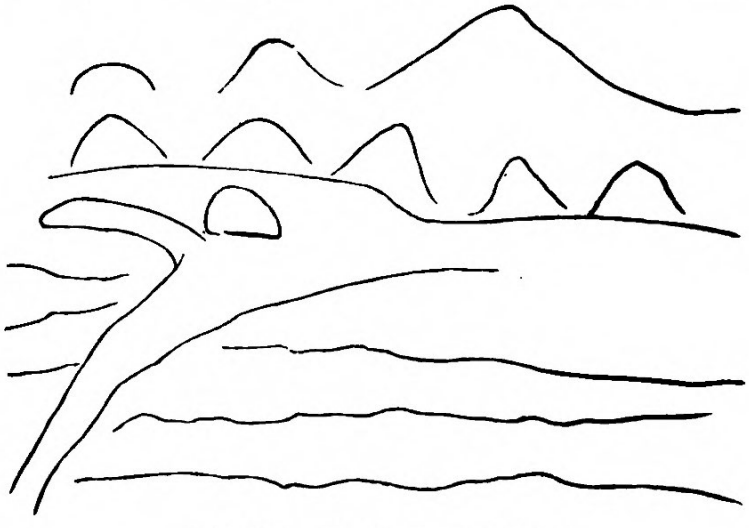


FIG. 36. — Markings on a rock.*

as much as twenty feet high. There is something on it quite well done. It seems to be a raft on water,

* It seems to be a rude sketch of the scenery in the vicinity of the lake, and perhaps of a platform, and a hut upon it.

with people on it. It does not seem cut deep, but marked in some way, — perhaps scratched (2). (Draws Fig. 37.)

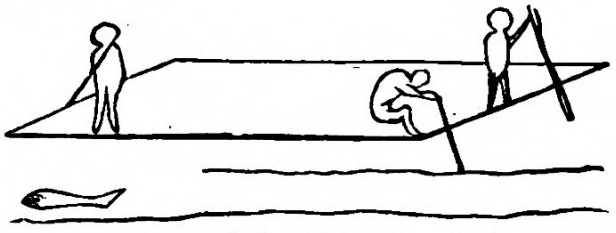


FIG. 37. — Raft, rudely represented.

"There is a good deal of mist over the lake."
("I wish you could find the people.")

THE PEOPLE.

"I see some now walking along on the land. They are dark-colored, and have a good deal of hair on their faces. There are as many as a dozen dressed in skins, that are worn over one shoulder, and under the other, and down to the knees. Their heads are bare." ("How dark are they?") "They are as dark as mulattoes.

"One of them has a large dish made of clay, as much as two feet across. (Draws Fig. 38.)



FIG. 38. — Dish made of clay.

"They must be nearly starved. They came to a place where there had been a feast; and some little, hard, dried-up fishes are lying where they had been thrown away, and they are beginning to eat them."

THEIR DWELLINGS.

"Oh! I see a village of houses on piles, — a Swiss lake-dwelling. (Commenced to draw Fig. 39.*) The houses are not all round: some are oval. They are made of clay. I do not know what is inside. There is nothing outside but clay.

"What labor it must have been to drive in all these stakes! I cannot understand why this wharf-place should be so much above the water. The water is quite deep near the land."

("How long is the platform?") "About two hundred yards, I should think. Some of the houses are very large. One of them is forty-three paces from one side to the other." ("How did you measure it?") "I walked on the platform from the outside of the wall on one side to the outside on the other. The platform is all covered with clay" (3). ("Is there any one on the platform now?") "Yes: several.

"There is a long stick supported by two others, where fish are drying. (There are many smaller mountains on this side of a large one.)

"There are men in a boat here, fishing with a net. One fellow is on the top of a house, and seems to be mending it: he has a lot of clay. There is an old net lying on the platform. There are birds, that look like swallows, flying along the edge of the water, and touching it occasionally.

* Keller supposes that the houses of the Swiss lake-dwellers were quadrangular; and psychometers frequently see them of that shape. I think the earlier dwellings were generally circular.

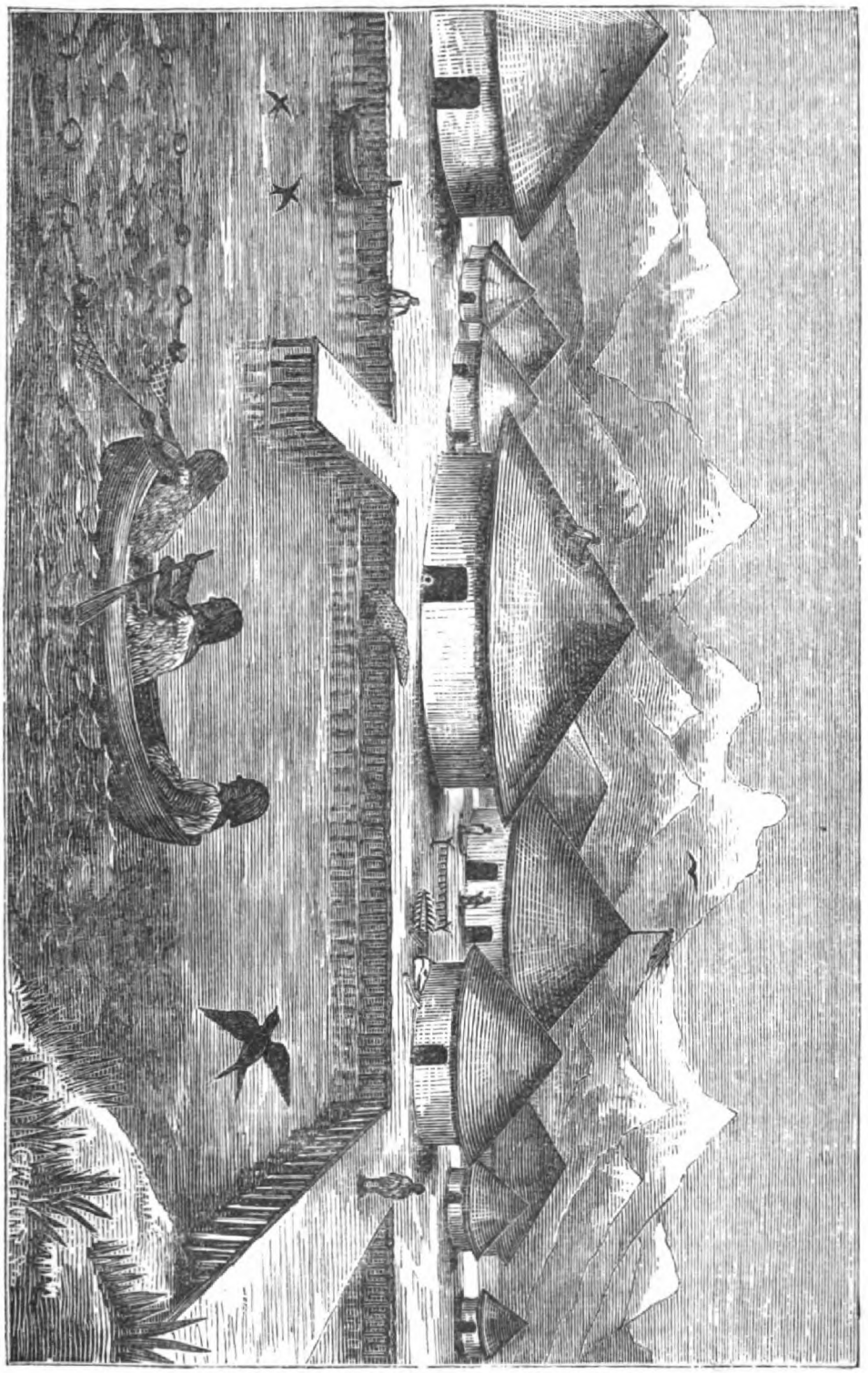


FIG. 89. — Lake-dwellings on Lake Pfeffikon.

"I see, in one place, relics of some very large animal, that they seem to have kept as a trophy, — a skull and some other bones. The skull is so large, I do not think I could lift it: it has conical teeth. I did not see it at first; though it is near where the fish are drying (4).

"There is a blue emblem on one of the houses, — strips of leather painted or dyed blue (5).

"A large bird is soaring up very high, — a very large bird; perhaps an eagle.

"I see some kind of a musical instrument in one of the houses. (Draws Fig. 40.) It is a hollow, wooden box, with wooden pins for tightening the strings: they are made of leather. The shorter the string, the higher the note.

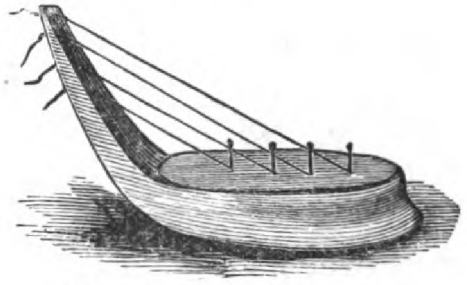


FIG. 40. — Musical instrument.

"I see beds, or what are meant for beds, on the floor. They are skins. There are holes in the wall, where I see weapons stuck. Some are meant for axes, I think. (Draws Fig. 41.) It is made of stone, and the handle is wood."

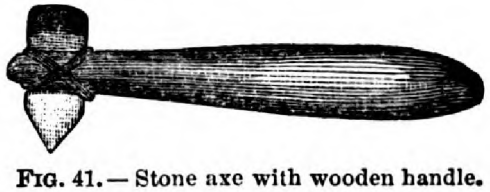


FIG. 41. — Stone axe with wooden handle.

MAKING A PLATFORM.

"Some men are building a new place farther out. They have got the piles down: they lay brush on them, and then clay over the brush. They do not let anybody go on till the clay is dry.

"One is driving piles. He has a big stone on a stick (it looks like a mallet); and three men below — one in one boat, and two in another — hold the pile. It is difficult work; but the piles are sharpened. They have heaps of them ready for use on the platform. There are so many workers, it does not take them long to build a place."

(1.) He calls it a large lake; but Pfeffikon is a small lake. This may be owing to the mist that he spoke of, which concealed from him the real size of the lake.

(2.) Representations of animals and men are extremely rare in the lake-settlements; and, in this respect, the ancient Swiss seem to have been far behind the cave-dwellers of the Dordogne. This may have been drawn by some visitor, or captive from another tribe.

(3.) It will be seen, from a subsequent examination, that the platforms were not always covered with clay. This clayey covering must have assisted materially in preserving the objects that fell into the lake, when it came to fall and be deposited above them.

(4.) He says the head resembled that of a large crocodile; but how such a trophy came to be there it is difficult to imagine.

(5.) Keller says, speaking of Robenhausen, "Amongst the relics of the settlers, which lie entombed in the mud of the bed of the lake, a number of pieces of leather have been found, the use of which is indeed unknown, but which still prove to us that some mode of preparing leather so as to make it supple and durable was not unknown." *

The same specimen was tried the next day, when the locality was known. I asked him to find their animals, and describe them. After a pause of about a minute, he said, "I saw it as an old place, — all broken down, and no one inhabiting it.

"I see it now almost as I saw it before. It seems a little nearer this time: it is a little larger. I see a goat; and a woman is milking it into a small earthen jar or pot that has markings on it. (Draws Fig. 42.) It seems to be near evening. The jar is not very symmetrical."

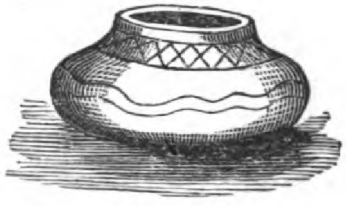


FIG. 42. — Milk jar.

THE CHIEF, AND THE CHIEF'S HOUSE.

"They have a chief. I see him now. He has the best and largest house. He is dressed better than the rest. He has pieces of skin fastened round his legs, with the hair outside, and dyed of different colors, so that they look very pretty. He has a neck-chain, that

* Keller's Lake-Dwellings, p. 335.

hangs down very low. It is made of pieces of bone, — the vertebræ of some animal, I think. (Draws Fig. 43.*) He has a stick in his hand, with feathers stuck in it: it looks something like a feather duster. They are blue and yellow and red; and must be dyed, I think. He has very little beard. He is very old.



FIG. 43. — A chief among the lake-dwellers.

"There are some nice-looking beds in the chief's house. Several skins are fastened together, and formed into a hammock; and he is lying now, and

* I should prefer a lighter complexion and a higher forehead; but I give it as the psychometer represented it.

swinging himself by pulling a string that is attached to the wall.

"There is a good-looking cupboard here too, and a number of pots in it. On one pot is a drawing of a bird's head. (Draws Fig. 44.)



FIG. 44. — Ornamented vessel.

"They have an excellent way to keep fish fresh. They have what looks like a great basket, made of sticks, and sunk into the water. They keep fish in there, and feed them till they want them, or till they are large. When they feed them, the other fishes come round to pick up the crumbs; and then men come with a net, and catch them.

"The lake seems full of fish. There are boats here, burned out and scraped. Most of them are in the shape of a bathing-tub, — long, with rounded ends.

"Why! they have tame ducks here about the same size as ours; but they do not quack: they make a singular sound. Some of the naked children are petting them. They are very tame. One got hold of a boy's nose: he dropped it quickly (1).

"Two men got into a row. One tried to push the other off the platform; but the other seized him, and they both dropped off into the water. They swam for a boat. One got in, and paddled off; but a man came and threw the other a leather strap, — pieces of

leather tied together for a rope, — and the men pulled him up.

" There are dangerous places here. One old house is in ruins. The floor is gone ; and I can look down into the water, and see the fishes.

" They do not seem very lively here to-day. There are not many people round.

" I see imitation fishes, made of leather, set up on poles near the houses. The wind blows them out like a flag. The hair is on them. (Draws Fig. 45.) I think they must have made a mistake with the tail."

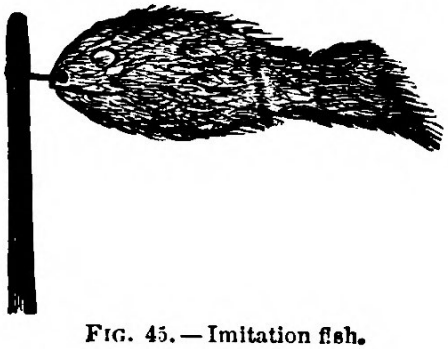


FIG. 45. — Imitation fish.

A WATER JAIL.

"I see a place now for punishing criminals. It is a square place below the platform, and covered with clay down to the water. Below that it is a kind of cage made of stakes. By clinging to them, they can just keep their heads out of water. Two are in now. I think they must be the two that were quarrelling. One cannot see any thing inside till one's eyes become accustomed to it. There is no light but what comes through the water. These fellows are hallooing. They are taking them out now. They are naked. The others are laughing at them.

"I thought once it might be a place for keeping fish: but it is a place for criminals; for they have brought another. They let him fall right down.

"The piles are driven so thick under the platform, that a boat could not move among them in places.

"I see a pretty sort of emblem now on a pole near the chief's house. It is of different colors and shapes, on the white side of a piece of skin. It is very well done (2). (Draws Fig. 46.*) Holes are

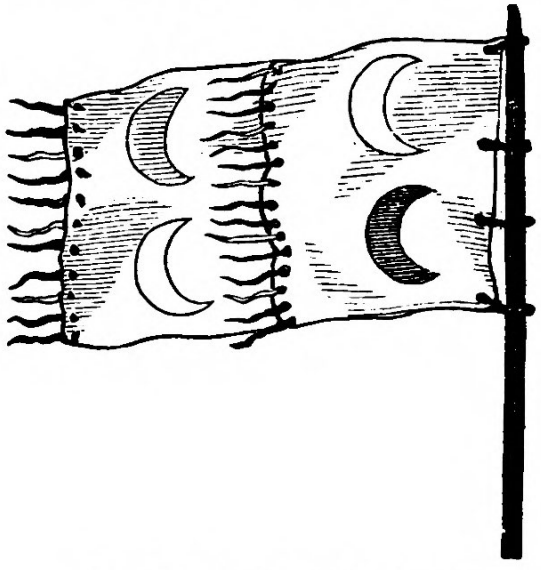


Fig. 46. — Flag of the lake-dwellers.

made through the skin; and those little tassels are pulled through, and tied on the other side. The hair on that side is blue. On another pole they have a large ball covered with leather, and painted. (Draws Fig. 47.) It is about a foot and a half in diameter. The leather is sewed on by making holes, and putting strings through, I think. Red and blue are their chief colors. They are handsome. I see no green."

* The colors on this flag were red, white, and blue.

A BOWLING-ALLEY.

"I see a long kind of shanty, where they play a game like nine-pins. The floor is made of clay, and is very smooth. At one end of the room are sticks set slanting in holes in the floor; and they roll balls so as to knock them out. The balls are made of wood, I think, covered with leather, and painted. They look like the great ball on the pole. The covers must have been put on wet, and sewed with strips of leather. When they become dry, they are tight."

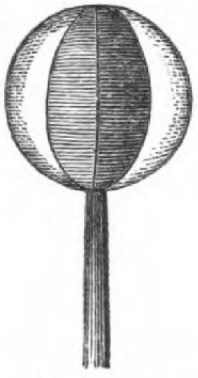


FIG. 47. — Painted ball on a pole.

A JUGGLER AMONG THE LAKE-DWELLERS.

"Here is some kind of a juggler. He makes a ball roll up his arm, and round his neck, and down the other arm, and back again. The rest look on with astonishment. He seems to be a different kind of man, — from another tribe.

"He let a ball drop off his hand, and then hit it with his foot, and knocked down three pins, — what the others could not do with their hands. There are men at the other end of the room to stop the balls

from going against the wall. They jumped out of the way, his ball came with such force. The floor is inclined, and the balls roll back again.

"He is balancing a ball on his head now, and throwing another one. The rest are looking on with wonder. One fellow took up a ball, and rolled it with all his might; but this man threw a ball that hit the other, and sent it flying. (The sticks slant toward the highest end, so that they may not be broken.)

"How terribly astonished they were then! He sent a ball with both hands, and gave it a twist, so that it came rolling back to him.

"His tricks never seem to be played out. He is considerably taller than some of them. He let a ball fall off his hand on to a man's head; and then turned, and seemed to apologize, as if he never meant it.

"A boat comes in now with a large turtle in it, and everybody runs out to see it. It looks a good deal like our snapping-turtle. The men in the boat throw a strap up, and some others pull it on to the platform.

"The juggler is fooling with it now. He has the strap in his hand, and pulls it from the edge of the platform. They crowd round to see what he is going to do. He let go of the strap; and some fellows near jumped into the water, they were so much afraid of being bitten."

(1.) At least two species of duck are known to have existed in the lake-settlements; but there is no evidence of their having been tamed.

(2.) This is quite interesting in connection with

the crescent-shaped objects that have been found at various lake-settlements. I think this must have been a flag, connected in some way with their worship. I feel quite sure that Sherman had no knowledge, at the time, of the significance of this emblem.

AN EARLY LAKE-SETTLEMENT.

Aug. 2, 1873.

Same specimen. I said to Sherman, "See them eat a meal." This he failed to do.

"I seem to be in a very much rougher place. The houses are not as good, and they are on a different plan. The piles are in long parallel lines, about thirty feet apart, and logs across and houses on them; no clay at all; like a bridge, only there are several rows of them. The houses have square corners, and are longer than wide.

"They have an article of earthenware for taking fish out of a net. It is like a great spoon full of holes, and fixed to a handle; and would hold — if the holes were closed — about two gallons. When there are too many fish in the net, they dip them out with this.

"One man here wears a bear's skin that looks like a great-coat. The head of the bear was cut off; then it was cut down in front about half way, the skin rolled back, and the flesh taken out; and he wears it just as the animal did.

"These men are very hairy indeed. The front of their legs and breast is covered with hair; but there is hardly any on the back of the body and legs. They have quite long beards.

"The piles were driven very closely together. All the houses seem to be of the same size. They are made of poles, and bunches of fagots fastened together at the ends to make them strong. The roof is covered with sticks, with dabs of clay to hold them in their places. It is a rough-looking place.

"In some things they seem ahead of the others. They have some excellent stone weapons.

"Some men are fishing here. They have great floats to their nets. (Draws the weapons, — Fig. 48.)

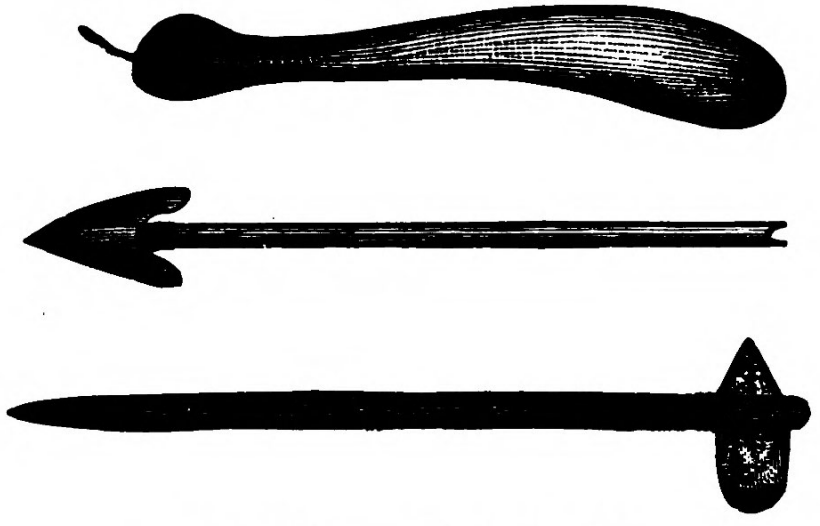


FIG. 48. — Weapons of the lake-dwellers.

"I see the drawing of a large fish on clay, in the inside of a house, on the wall. (Draws Fig. 49.) The clay is not very smooth where the sticks are underneath.

"There is a weapon of stone here of tremendous size. It is a kind of axe. (Draws Fig. 50.) The stone has shiny particles in it." (Mica schist?)

WEAPON MAKING AND POLISHING.

"I see a large stone where they rub their axes, knives, and things, to sharpen them. Some men are using it now. It is quite a large stone. I don't know how they ever got it on the platform. There are many hollows in it that are quite smooth, — a large one in the middle. (Draws Fig. 51.)

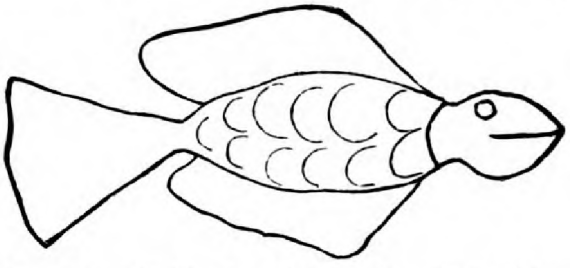


FIG. 49. — Outline of a fish on the wall of a hut.

"I see them making these weapons. They have a vessel like a dipper, full of water, and fill each hole half full, and rub till it is all mud, that sticks on their hairy arms. One of them has a mark on his leg as if some one had struck him a terrible blow with one of those axes.

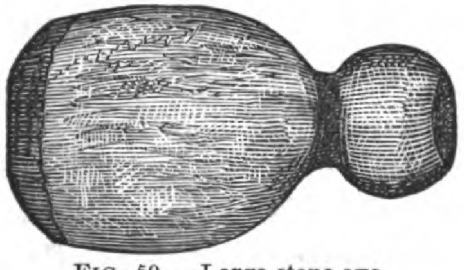


FIG. 50. — Large stone axe.

"It is wonderful how fast they rub them down. The rock underneath grinds them down very fast. Some in another place are making them. One man

takes a big stone, and smashes another one ; then he picks out the pieces that suit him best for making arrows. Another is making an axe. He has a kind of stone-hammer, and chips off pieces. Little children are round picking up the chips, and trying to make arrows themselves.

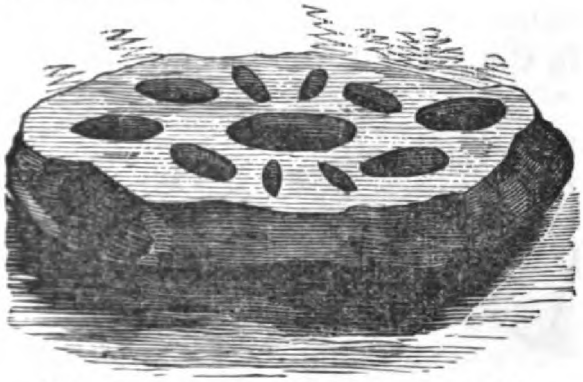


FIG. 51. — Stone for polishing weapons on.

" It does not take this man long to make them. I think he has made two to-day. He is an old man ; and he understands it well. There are not many men that know how rock splits as well as he does. He has a stone that he holds it on slanting, and he goes " click, click," striking off a chip every time ; and I can hear the others rubbing and scouring away. It is done back of the buildings.

" They are beginning to make the platform smooth with clay. About twenty boys and girls are at work bringing clay on their heads, and plastering it down. One little fellow must be the chief's son, he is so dressed up. He wears a bear's skin, and has colored leathers round his neck, wrists, and ankles.

" I see nothing for beds but dried leaves in one corner of the room. I can see the forms of persons who

have lain there." ("How many?") "Twenty, I think, by the look of it."

"It is strange to see so many houses, and so few people. They must be off somewhere. I see very few, except the weapon-makers and the fishermen.

"That boy bosses the job: he orders the children round, and they obey him."

LAKE-DWELLERS IN WINTER.

"It turns to winter at once: all is covered with snow. Fires are on clay in the middle of each house. There is a kind of clay trough for a fireplace. The men are well dressed in bears' skins. One man has a skin on as the animal wore it; and another underneath, the opposite way, so as to protect his breast.

"They are catching fish through holes in the ice. The fish are very hungry. They drop a few crumbs, and then haul them up with their dippers. Two men watch them as they lie on the ice; but fellows crawl up and steal them out from under their legs, and eat them raw.

"They break holes in the ice, about three feet in diameter, with great stones. What they sprinkle in the holes looks very much like bread. As one man sprinkles the crumbs, the other has a dipper full of holes under, and lifts the fish out: sometimes it is full."

DOMESTIC ANIMALS OF THE LAKE-DWELLERS.

We were desirous to obtain a more detailed description of their mode of worship; and Mrs. Denton made

the following examination for that purpose, but failed, yet obtained some additional information regarding their domestic animals, and some glimpses of their daily life. Her statements regarding the domestic animals seemed so important, that she subsequently wrote out the following from the notes taken at the time: —

"I see a great many domestic animals (cattle and fowls), some of them something like ours, and some of them quite different from any I know of. They are all in a large yard, and on the land, — cattle and fowls together.

"The general appearance of the birds is quite like that of our more common variety of domestic or barn-yard fowls; but they are not so high, and the body is smaller in size, though it is apparently longer (1).

"Some of the animals resembling the common cow seem to be a variety with short legs, short, thick bodies, short necks, and short but thick horns. There are others, apparently another variety, in every respect larger than these, — longer and larger legs, longer bodies, larger necks and heads, and longer (a great deal longer) horns, that curve and bend so gracefully, that they form a most magnificent appendage to the great strong frame that supports them (2).

"Another animal resembles the horse in form, and is about half the size of that animal. It has an intelligent, active look; a trim, sleek body; and a neat but very frowzy-looking head, and long ears. It appears as much at home in that yard, as domestic, as do any of our animals in this country; though it is, in some respects, unlike any domestic animal I know. Some

of these have coverings over them resembling blankets of some kind (3).

"There is also an animal with frowzy head and short horns, somewhat resembling the buffalo in form; though I think it is considerably smaller (4).

"There is a kind of hog here: it has a larger frame than the varieties I am accustomed to see, and a much longer and more peaked snout. I do not think it could be made to measure as much around the body, with any amount of fattening, as our farmers generally succeed in making the common hog measure (5).

"Beyond this yard, and extending to the right, is a body of water: I should think, a large pond or small lake. Out on the water I see a platform, with some kind of houses upon it. Between me and the buildings, on that side of the platform nearest me, is a long line of white clothes, as if hung out to dry. They look white as bleached linen (6). The line of clothes prevents me from seeing the upper portion of the dwellings. I think they are four-cornered, though not all square, nor all of a size.

"On the platform, near one of the dwellings, I see a bench, with a square box (I should call it a washing-box) standing on it. It has all the appearance of having just been used for washing. In each of the corners a three-sided piece of wood is fastened, — apparently to make it strong and tight. Several children are at play beside this dwelling. I notice one particularly, — a bright-eyed, chubby-faced little boy. I do not get the features of the others. I saw all these things on the platform, except the inside of the washing-box, by looking from where I stand, by this yard

of animals, under the clothes as they hung to dry. When I examined the inside of that box, I seemed to be standing over it; but I saw nothing else at the time.

"The line extends about three or four hundred feet, and the clothes now occupy about a hundred feet. I think it is used by several, if not by all, of the families on this platform.

"Now I see a great many people at some distance from me on the land, but all in shadow; and now I see more distinctly, on the platform, several women sewing together skins, — I think, for some kind of covering.

"There is an air of general industry and thrift connected with this people. I should think them hardy, industrious, and honest. I get nothing in regard to their religious sentiments or their modes of worship."

(1.) Rütimeyer says, "Not a single trace of the domestic fowl has yet been found amongst the lake-dwellings." Yet he informs us that a single bone of the common hen was found at Morges; though he says it had a very suspicious appearance. I have, however, so much confidence in these psychometric revelations, that I doubt not future discoveries will prove that the lake-dwellers had domestic birds resembling the common fowl of our barn-yards.

(2.) According to Rütimeyer, there have been found in the lake-villages two wild species of cattle, — the urus, a very large species, described by Cæsar as swift and strong, and hardly inferior to the elephant in size; and the bison, or European buffalo, which, in many respects, resembled the buffalo of

America; and, besides these, four principal races of domestic oxen.* The large cattle, with long curved horns, were probably some domesticated variety of the gigantic urus; while the smaller cattle may have been a variety of the marsh-cow, now found in Switzerland.

(3.) This, though differing from the ass of the present time, seems to have been allied to it. The ass has been found at some of the lake-villages.

(4.) This was probably the European bison, or buffalo, which has been found at Robenhausen.

(5.) Remains of a hog, called by Rütimeyer marsh-swine, and considered by him a distinct form, have been found at Robenhausen and other localities.

(6.) Various kinds of woven linen-cloth have been found in the lake-dwellings, and some even embroidered.†

A few days later, an examination of the same specimen was made by Mrs. Denton, and the following written by her: —

"I see a place on land where piles are driven into the ground to support a roof overhead. The piles are perhaps two or three feet apart. There are quite a number of these pile 'frames.' Some have flat, or nearly flat, roofs; some quite conical; and many are intermediate. In these cases the 'frames' are circular. Many of the 'frames' are, however, four-cornered; and on these the roofs are made with a ridge.

"There is some cultivation of the soil here; but I

* Lubbock's Prehistoric Times, p. 195.

† Keller's Lake-Dwellings, p. 329.

cannot tell what implements are used for that purpose, nor what articles are grown.

"Now I see 'lake-dwellings' at a distance. The dwellings follow the form of the shore on that side of the lake where they are built. It may be the same lake; but I do not see the same dwellings that I saw in a previous examination. I judge it to be another part of the same lake.

"Nothing connected with this people surprises me more than the quiet grace and dignity that characterize all their habits of life. If this characteristic is natural, they surpass, in this respect, any people with whose habits I am at all familiar. If it is acquired, it evidences a state of culture of which any nation of to-day might be justly proud; and is a result, it seems to me, which only centuries of peace and plenty could insure.

"Now I see a large number of them preparing to leave. A strange feeling of anxiety has come over them. They seem sorrowful, apprehensive; appear to feel incapable of judging the probabilities of the future, and to lack confidence in their ability to avert some threatened danger. All feeling of security appears to have left them. There is anxiety for those that leave, and perhaps equal anxiety for those that remain; but all this feeling is subordinated to that of the necessity which compels this undertaking. This feeling of *necessity* seems to me to be strongly connected with the needs of another settlement, towards which all their thoughts — save those for their own safety — appear to be turned; and even their own safety seems linked with that of the settle-

ment beyond. There is, however, no demonstrative manifestation of grief, no frantic exhibition of terror; only energetic and apparently well-directed effort for the accomplishment of the measures proposed. Of these measures, whatever they may be, I can only understand that they are for the protection of themselves and distant friends if possible.

"Now they seem to have left, and I am trying to follow them. I want to find, if I can, the cause of all this anxiety. Their route winds up and around among the hills. They seem to feel that their country is desolate, or to believe that it is about to become so: I cannot tell which. They go over the hilly range, and into a more even country beyond.

"There has been some chapter of similar horror in the history of their ancestors. They seem to recur to it now as to some long-remembered dream, which, in their security, they had well-nigh forgotten.

"Now I see great numbers of a very different people. These are white. This people, I am confident, is the source of their terror. I have lost sight of the others. But I find that these people are approaching their settlements; and they seem to have little regard for the rights of any one they find in their way. I do not think they would wantonly destroy an inoffensive people; and, unless they saw some advantage to themselves to be directly derived from sweeping them off, would probably allow them to exist. But in this case there is abundant reason. The accumulations of that peaceful industry are, in some respects, the very necessities for which these wild barbarians are now moving; and these

people are directly in their path. They seem to have little or no appreciation of the superior character of the people whose possessions they are about to overrun; and they will, in all probability, reduce them to a state of slavery, or murder them if they offer resistance.

"Where could these people have come from? I believe I can trace them. I see them traversing a great extent of territory to the east and north-east. The farther east I go, the greater their numbers appear. But I am going back in time as well as backward over the pathway they have come. I am now in sight of a long chain of mountains running nearly north and south; and, on this side of the mountains, the whole territory, to a great distance north and south, seems literally crowded with them. They live principally in rude tents or sheds, or wander from place to place as the season suits them. They also have some structures that approach more nearly the modern idea of a cabin. They seem to be a strong, tough race, exceedingly well developed physically, and of matchless symmetry. If they were the ancestors of our race, we have degenerated, in this respect, almost beyond estimate.

"They have here large droves or herds of animals, among which I notice as quite conspicuous an animal smaller than the horse; and all the individuals I have seen are striped red and white, either with or without spots.

"I see some kind of shallow kettle, or better, perhaps, broad, deep pan, with four ears at equal distances from each other. This is suspended from the

uplifted end of a pole, or 'sweep,' by two chains, made apparently of some kind of metal; each end of the chains being fastened to an ear of the pan.

"I cannot tell of what the pan is made; but it is, I should think, abundantly large enough to support an entire ox after having been prepared for a roast. The opposite end of the 'sweep' is used for swinging it over and off the fire.

"I do not think they know of the lake-dwellers while living here; nor do they seem to have known of them until after other migrations to the westward.

"From the extensive valley that sweeps the base of this mountain-range they gradually moved westward, covering a tract of country far less in width from north to south than the one here occupied.

"Farther to the westward they again spread out, but this time principally to the northward, still occupying a vast extent of country, but none of it extending so far to the south as did a large portion of their original possessions, or as this valley on the western side of the mountains. From thence, the southern boundary of the country they appropriated appears to have receded farther and farther to the north, until, when they reached the land of the lake-dwellers, they were really the Northmen of that ancient time. Their actual location, however, at that time, was to the north-east of the lake-dwellers.

"These migrations appear to have been made only when they became over-crowded, or the exhausted condition of the country where they had permanently made their homes compelled them to seek newer and more productive lands. They never seem

in these movings to have gone in an entire body; but they gradually moved westward, — much as the white race is doing to-day.

"Farther back in time, and farther to the eastward, I feel the influence of other two races, from the amalgamation of which this race has resulted. And yet this race appears to have come from beyond those mountains, that I think must be the Ural Mountains, where they covered a vast extent of country, and where I still find them to have been little changed, and without any knowledge of their double origin. Here they seem to have dwelt for a great length of time before crossing the mountains at all.

"Still farther back in time I find a people very inferior in stature and in general physical appearance, but with white skins; living in places made of earth, resembling ant-hills in form, with but one opening, or entrance, and that so low, that they were obliged to stoop low when passing in and out. There seems to have been some reason for making the entrance so low; but I cannot tell what it was. These habitations, if they can be called such, were made of earth mixed with water; and I cannot find that any other ingredients were used. These people appear to bear some direct relation to those noble physical forms that I just saw, of a later age and more western locality; and were, I believe, one of the races from which those finer forms descended. The other race I do not see; but I feel an influence extending to the southward, while the same influence derived from these people continues on to the eastward. These last people that I see appear to me to have occupied

Central Asia; and I seem to trace them out in consequence of the influence which reaches me through their relation to that later race."

This examination appears to point to the Aryan occupancy of Europe, and the introduction of the bronze age in consequence of this; the Robenhausen settlements belonging exclusively to the stone age: but, if this is so, the stone age in Switzerland must be much older than archæologists have generally supposed.

Farewell, ye lake-dwellers! Your huts are gone, your platforms have perished; thick beds of peat have grown over the places that were once your well-beloved homes. The only memorials of you that greet the eye of the archæologist are the fragments that have been exhumed from the bottoms of the lakes that supplied you with food, and over whose waters you safely dwelt. But you still live, — not alone in your descendants, who have inherited the courage, the industry, the mechanical ingenuity, the religious sentiment, that characterized you; nor in the life which the liberated spirit enjoys in the new condition of being into which it is ushered by death; but you live as you lived in the days of yore. You still chop down trees with your stone hatchets, and drive them into the bed of the lake, and lay your platforms, and rear your dwellings. You spread your nets, and shout with delight as they enclose their struggling captives. You roam through the woods, and climb the mountains, and return laden with the bear and the deer, transfixed by the arrows from your strong bows. You still meet on your lordly mountains and chant your rude hymns to the "queen of

heaven," and solemnly deposit your dead in the stony recesses of your hills. Though all but vanished from the material world, you have passed into a realm where all that ever has been on our planet still remains, apparently as enduring as time, and less changeless than the stars.

THE CAVE-DWELLERS OF THE DORDOGNE.

Those persons who have kept themselves informed regarding the archæological discoveries which so preeminently distinguish the age in which we live cannot fail to have become interested in the ancient people of Central France, generally known as the "cave-dwellers of the Dordogne." Immensely older than all history, lost in what seemed to be the impenetrable darkness of a remote antiquity, by the faithful labors of Lartet, Christy, Marquis de Vibraye, and others, they have been rescued from oblivion, and stand before us with a freshness of color such as characterizes the paintings of the Egyptians that have been sealed from daylight in their tombs for thousands of years.

But, though so much had been discovered, much remained to be known. Of what race were they? What was the language that they spoke? Did surrounding populations exist? and, if so, what were their relations to them? Did they cultivate the ground? and, if they did, what crops did they raise? Had they domesticated any animals? Did they live in communities, or in separate families? Had they any religious ceremonies? These and many other questions thinkers asked; but there was no definite reply.

Here was a good opportunity for psychometry. Could the psychometer, without a hint being given, discover this long-lost people? I was quite sure, that, under favorable conditions, he could. Could he see their persons, and describe them? Could he hear their language, learn their habits, and see their religious rites? Certainly: our past experience assured me that this could be done.

Through the kindness of a gentleman in London, I received a small flint knife from the Christy Collection in the British Museum, and labelled "La Madeleine," — the name of a cave in the valley of the Dordogne in which many remains of some early race have been discovered. On the day that it arrived, I put it into the hand of Sherman, who did not see it, and could not have had, as I think, the faintest idea of its character. The following contains a record of what was said by him during the examinations, which were continued, at intervals, during several weeks.

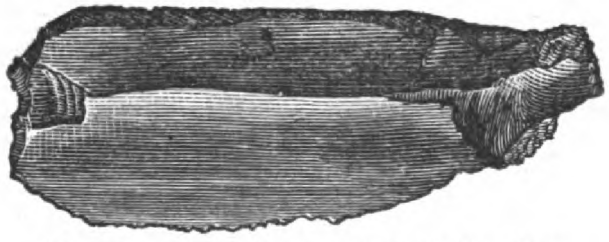


FIG. 52. — Flint knife from the Madeleine Cave.

THEIR OUTSIDE DWELLINGS.

MAY 27, 1873.

"I see an animal with fins that are like the rounded fins of a cuttle-fish" (1). ("You are too far back. Get human influences.")

"I see a circle of houses, or a circular row of sheds; and inside are many round, conical-roofed houses. I see some fowls inside. They must be tame." ("Describe them.") "They are a good deal like some kinds of barn-yard fowls. They are of a reddish-brown color, but speckled with white (2). I see an animal that looks like a dog. It has a long nose, and looks like a hound, but is smaller (3).

"That circular row of sheds forms a wall round the houses. There is just one entrance, but no gate. The back of the shed is about nine or ten feet high. (Draws Fig. 53.)

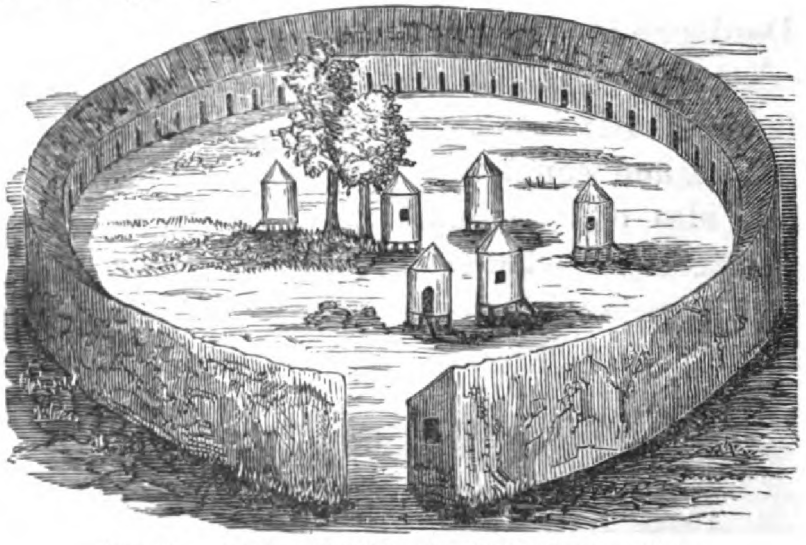


FIG. 53. — Ancient dwellings in the Dordogne valley.

"A little way off I see a fence made of sticks, and some cattle, or animals, with horns, that look like cows; but they are smaller than our cattle (4).

"Some fellows are sitting on a fence, looking at them. They are a good deal like negroes, with very thick lips, and dark, curly hair, but not as curly as negroes'. They have a very dark complexion; are as black as negroes" (5).

("How many are there?") "There are two large, and one small." ("How are they clad?") "One has a kind of apron that hangs down to his knees, — a skin of some animal: the other has a piece of the same round the middle. The little fellow is naked, except a kind of bag on his back, — for a pocket, I should think.

"Some others are coming now. They have a good many fish. They are broad, like a sea-bass; and the head has a pinkish color. They have them strung through the eyes on sticks (6).

"The ones on the fence leap off, and run to meet them. How they do tear around! One jumped over a lot of brier-bushes as he ran down the hill. The little fellow could not jump over the brier-patch, and one of them threw him a small fish. He takes hold of the skin with his teeth, and pulls and rips it off, and spits it out. He cannot take time to scale it. He has had some practice at that. Now he is eating it raw.

"They have five or six hundred pounds of fish, and are taking them up to their houses.

"They are going into the enclosure. They are shouting, they are so excited, over their success. From every little house men and women are coming out in crowds (7).

"They have one good thing, — a spring in the centre of the enclosure. It runs out underneath the shed, and makes a small brook. The ground is all trodden down, except a grassy place around the spring.

"They are putting the fish in the spring, and are

washing them; but they are still on the sticks. The fish will weigh, I think, about a pound each.

"Three or four are in washing every fish. They are almost all alive. As fast as they wash them, they lay them on the grass, still on the sticks.

"They have a fire going now. They do every thing very quickly, there are so many of them. They cook them with the scales on, and on the sticks too; and they support them on a crotched stick at each end. It is a large fire.

"I see one very large fish. Two fellows are carrying it. It is five or six feet long. They are just bringing it in. It is all they can do to carry it. It is alive, and shoves them about when it struggles. They go to the spring; and everybody is looking at them. This fish has a long snout, like a pickerel, and long, sharp teeth. (Draws Fig. 54.)

"The fowls are very tame, — they are all round among the crowd. The big fish swims round in the spring, though the water is hardly deep enough to cover it over; but it comes up fast."

("How are the women dressed?") "Very poorly; hardly any thing on: what they have are skins. I see one man who seems to be a chief. He has pants and jacket of skin, with the hair outside (8). He has a stick, with feathers at the end, — blue and red" (9). ("Is he larger than the others?") "He is a little more fleshy. He has something on his head made of plaited reeds, — a sort of cap; but there is no top to it. It is more like a wreath.

"Some little boys are playing with a small turtle."

DRAWINGS ON THE HOUSE OF A CHIEF.

"I see some native drawings on, I think, the chief's

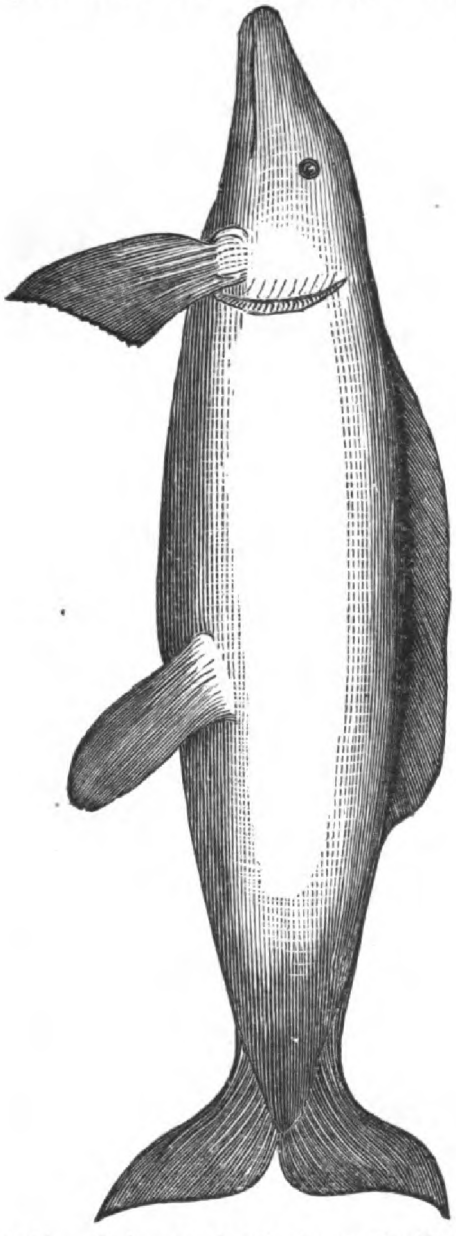


FIG. 54. — Fish eaten by the "cave-dwellers."

house. It is the best house. The side is covered with clay, and made smooth (I don't know how);

and the drawings are made on that. I can draw them. (Draws Fig. 55.) There are fish, and some kind of an animal: I don't know what. It may be an elephant; but I don't know. It has a tremendously long tail. I

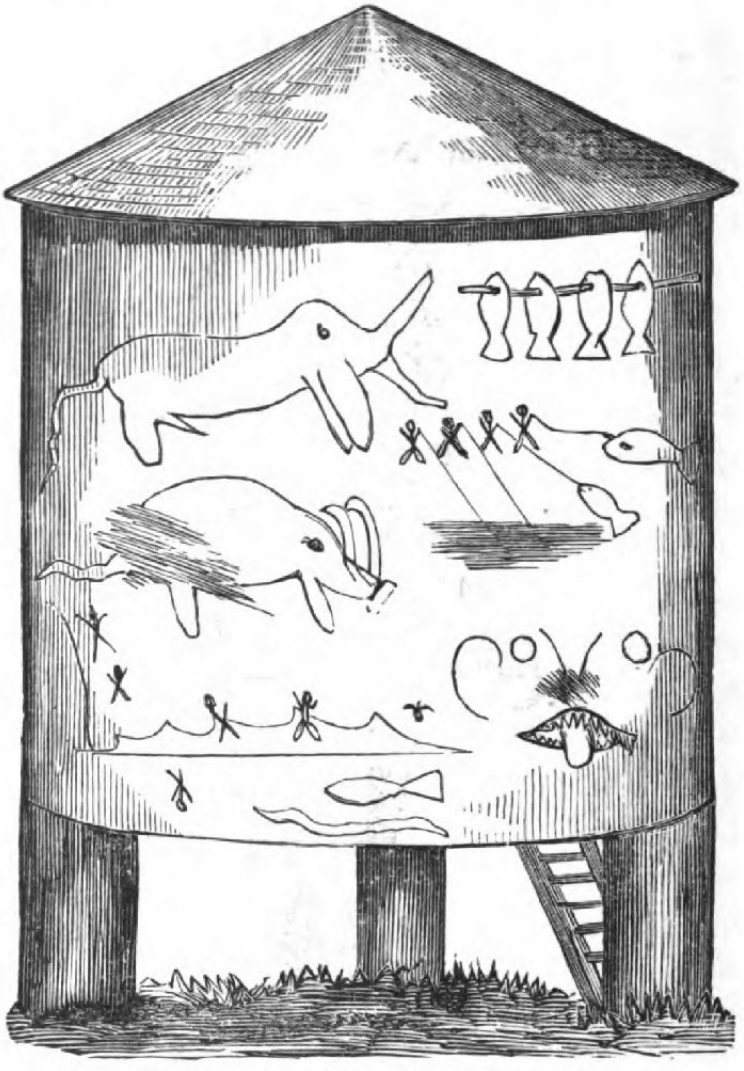


FIG. 55.—Drawings on the chief's house.

think it must be a fanciful tail. The drawing is made for an elephant, I am sure; but it is poorly done.

"I see what looks like a fishing-scene. I am draw-

ing them as they are on the walls." (He placed the specimen to his forehead frequently as he went on with the drawing.) "The men on this are very rudely drawn. It is not finished, or it is scratched out. (It is drawn with something black and thick. It must be something like boot-blacking. It makes a slight ridge.) Another mammal is, I think, some kind of a boar. It is partly rubbed out.

"Here is a sort of comic face. I hardly know what to make of that.

"Now I see a picture of a swimming or diving scene; though I can hardly tell what it is. But I will draw it (10).

"That is all the pictures there are.

"Now they are busy eating the fishes, sitting on this grassy place round the spring. They let them stay on the stick till they drop off; then they are done; and they grab them, and run.

"A woman is carrying water in a large jar that has a drawing on it; I think, a cow. She can sling it to her back. The cow is represented with a very large bag (11). (Draws Fig. 56.)



FIG. 56. — Water-jar.

"They talk all the time they are eating.

"I see the skull of a boar here, with quite long, curved tusks" (12).

("Do you see any trees?") "There are some

trees in the enclosure near the chief's house. There are plenty outside. The trees have large leaves, some eighteen inches long."

("How are the houses made?") "I think they are made of sticks plastered with clay. The chief's house looks pretty well, compared with the others. He has some good weapons here. One is a spear, — a long stick, with a sharp stone about five inches long, fastened to the end. I saw other handles."

After the examination: "Most of the people lived in the sheds. They had little places partitioned off; one for each family, I think. The better classes lived in the centre."

(1.) This vision was related, as I thought, to the cretaceous time, — when the material was being deposited at the sea-bottom, of which the flint was formed. If I had not directed him to the human influences, he would, in all probability, have given a description of the cretaceous time, and the organic forms that then flourished.

(2.) No remains of our domestic fowls have been found in the Dordogne caves, nor yet in the Swiss lake-deposits. I think, however, that the ancient inhabitants of the Dordogne valley had domestic fowls of some kind. The bird may have been the ptarmigan, which has been found in what are believed to be contemporaneous deposits.

(3.) Nor have the remains of the dog been discovered. Lubbock, speaking of the animal remains found in the valley of the Dordogne, says, "The sheep and goat are entirely wanting; and, what is still more remarkable, even the dog appears to be absent."

So far, it would seem as if the boy had come in contact with an entirely different people, — a people not living in caves, but in sheds and houses, and that had domestic fowls and dogs. It was to be expected, however, that the actual vision of the people, and their life, would reveal more to us than the *débris* left in caves had done. Not even the lowest savages would be content to dwell in caves in summer, nor could they shelter a large population; and though the caves might have been their original dwellings, as their civilization progressed, and their numbers increased, they would form dwelling-places out of doors.

(4.) The remains of the ox have been discovered in the Dordogne caves; but there is no evidence of its having been domesticated. Domestication would have to continue for some time, however, before its effects would be visible on the bones. Lubbock says, "No remains have been found, which, in the opinion of MM. Christy and Lartet, can be referred to domestic animals. It is true that bones of the ox and horse occur; but there is no evidence that they belonged to domesticated individuals." *

(5.) The negroid type of some of the early occupants of Europe has been inferred from various crania which have been discovered, having a configuration very similar to that of the present negro race, yet with sufficient difference to show them to have been distinct. Büchner says, "Most of the discoveries of the so-called quarternary period indicate

* Prehistoric Times, p. 316.

a small race with a narrow skull and prognathous jaws, and therefore of a type resembling that of the Negroes or Mongols." * This race was probably the same as that so frequently seen by the psychometer in Italy. These cattle-watchers were probably of an inferior type.

(6.) It has been supposed that they did not fish, since no fish-bones have been found in the Madeleine and neighboring caves. This may be true of the original cave-dwellers: but these people, as we shall see, cooked their fish out of doors; and the bones could not, therefore, be found in the caves.

(7.) Fig. 53 represents the enclosure as he drew it at the close of the examination, with the openings into it, which answered for door-ways; while in the centre are the houses of the chiefs, and two trees near the spring, that have been left for shade. The Caffres build kraals very similar to this at the present day.

(8.) The bone needles found in the Madeleine and neighboring caves, as well as the cuts on the canon-bones of deer, showing where the long tendons were severed, show conclusively that they sewed, and hence fashioned clothes, which would be of skin until the art of weaving became known.

(9.) Numerous "*bâtons* of command" — emblems of authority — have been found in the caves; and this seems to have been somewhat similar. The Swiss lake-dwellers resembled them in this, as they did in many other respects.

* Büchner's Man, p. 50.

(10.) The figures are not as well executed as some of those found in the Madeleine cave; but they are an interesting addition to our knowledge of that primitive time. Fig. 57 is a representation of a plate



FIG. 57.—Engraving on an ivory plate.

of ivory found at the Madeleine, on which is an engraving of the mammoth, "with his head erect, his brow concave, his great tusks bent, his small eye, his long trunk, his tail elevated, and his long

mane; in a word, precisely like the mammoths in flesh and bones which a perpetual frost has preserved to our own day on the banks of the Lena." * But the drawing of an elephant seen by Sherman does not represent a mammoth, but some elephant so destitute of hair, that all parts of the body could be distinctly seen. The skull is not as prominent; the tusk is not as much bent; the tail is much longer, and destitute of that hairy tuft that the artist, however rude, could hardly have failed to depict. Could another species of elephant have existed then in France? The bones of *Elephas antiquus* have been found associated with the remains of man in a few European localities; and it is possible that some survived even down to the time of the ancient dwellers in the Dordogne valley. The chief, whose house was decorated, may have slain one, and the drawing have been executed to commemorate the fact.

(11.) It is generally supposed that they were destitute of pottery; but a people so far advanced in art as their drawings indicate could hardly fail to be acquainted with the potter's art, known to some of the most barbarous of living tribes. The cow represented, it will be seen, has a long body and short legs, and is just as he sketched it. Mrs. Denton's examination in which such cattle are described was not made till afterward; and of her description he knows nothing even now.

(12.) Remains of the boar, though rare, have been found in the caves.

* Broca, in Nature, vol. vii. p. 828.

THEIR CAVE HOME.

Afterward, on the same day, Mrs. Denton tried the same specimen, and I took notes of the examination; but there was so much that she seemed to be unable to describe at once, that, at the close of the examination, she wrote out in detail from the notes and from memory. She was unaware that I had such a specimen, and knew nothing regarding its character.

"I seem to be on the outside of an entrance into a hill, as if the hill were hollow, with a door-way. There are sticks near and in the entrance; and I should judge they were used for closing it when desirable.

"Near this place, and on the outside, are several kinds of animals. One of these I should call a cow; though the legs are shorter, and the body longer and larger, than ours are (1). The hill is mostly covered with trees; though there is a considerable tract of land extending down a part of this side of the hill into the valley, that is quite free from them. It is evident, from appearances, that they have been removed by persons about here; for in several places are sticks nearly of a size, and driven into the ground, as if to mark off particular patches for certain purposes. At one place near that entrance are three poles, driven at almost equal distances, and so arranged that the tops all meet at a point.

"I should like to go into that hollow in the hill; but it looks dark, and I cannot go without difficulty. It is, I think, quite spacious inside. I am now just inside the entrance; but I cannot easily remain here: I do not know why.

"I do not know how they light the place; and there is not much light. I see a few people in here. Two are standing with their backs toward me, and there are several in the farther part of the place; but I see them very indistinctly. The place seems so dimly lighted, that it is with difficulty I can distinguish any thing. I cannot tell what they are like; for I see them more like shadows than living forms" (2).

(An hour afterward.) "There seem to be a great many small rocks about. Whether they belong to the place or not, I do not know.

"Now I see a place scooped out of the ground, outside of, and at a little distance from, that entrance to the hill. A fire is burning in it; and what looks like a kettle of some kind has been set on, apparently to boil something in (3).

"I am going farther back in time now. That opening in the hill seems like a cave, partly natural, and partly artificial. I see a door at the entrance now. It is made of sticks braided or woven together (4). It is the most singular arrangement for a door that I ever thought of.

"There is a steep, winding path up the hill, along which they frequently go both by night and day; but for what purpose, or to what distance, I cannot tell. When the night is dark, there are lights placed at certain points along the way; whether because it is dangerous or not, I do know.

"I saw a person then, — a singular-looking specimen. I see many of them. They have skins of animals over them. Some are fastened at the throat,

and hang loosely about the person, like a cloak; while others appear as if tied over the body of the person by the skins of the legs. In this style the skin of the body of the animal fits closely to the body of the person, or nearly so, and, if desired, is more closely held by something passing around the waist. In some cases, the hair, or fur, is worn on the inside; in others, on the outside. I think they are changed as the weather requires.

"There are numbers of these people on the hill-side; but I cannot describe their features. I do not see them distinctly enough. I see many groups of children.

"I see a long, low structure, mostly of rocks and clay. I do not know for what purpose it is built."

(1.) This agrees with Sherman's statement of their possession of domestic cattle, though they differ somewhat regarding the size; more, I think, owing to Mrs. Denton's definiteness than to any real difference in the objects seen.

(2.) This seems to have been at a time when the caves were used as dwellings. They may have been used at certain seasons of the year, even when out-dwellings were used in favorable weather.

(3.) These people, like those seen by Sherman, had learned the potter's art.

(4.) Archæologists had come to the conclusion that the entrances of the caves were closed in this way, from the condition of the bones found in them. Broca says, "When they went out fishing or hunting, they closed the mouth of their caves to prevent the entrance of carnivora. A single bone found at

the Madeleine has the trace of an hyena's teeth. This animal may have once, by accident, gained an entrance. The hyena was rare at that epoch. But wolves and foxes were numerous; and, if they did not come and gnaw the bones scattered all over the floor of the cave, it was because the latter was carefully closed. As there is no vestige of a stone door at the approach to our caves, the troglodytes, doubtless, closed their doors with palisades." *

A FUNERAL AMONG THE "CAVE-DWELLERS."

Two days afterward, the same specimen was tried by Sherman again as before.

"I see the same people that I saw before. They are going into a cave, — a procession of them. They are carrying a dead man on a couple of sticks with sticks across them, — two men at each end. There are a good many stalactites in the cave. It has a very wide mouth for the size of the cave. They have torches with them. I see some other bodies in there, — five, lying near the side, with their heads to the side of the cave.

"Well, that is curious! There is a hole goes up to the daylight, about midway along the cave; and some men are coming down there: it is very steep and dangerous (1). They have put this body down with the rest.

"I see as many as a hundred bodies in another part of the cave, farther in, pretty near the end. They look fearful when they are lighted up." ("Are

* Nature, vol. vii. p. 328.

they covered in any way?") "On one I see a skin." ("Is there any thing placed near them?") "On the wall I see irregular lines above each one. Some are skeletons only, others dried-up bodies.

"In another division are a number of bodies set up against the wall of the cave in a sitting posture.

"Those who came in walk round with their torches and look at them. This is quite a large cave.

"Now I see some pottery near one body, that is in a small place, back of the rest, by itself. There are four handles on one vessel. (Draws Fig. 58.) Another looks as if it were on legs (Fig. 59); and another one, the largest, has a face on it (Fig. 60).



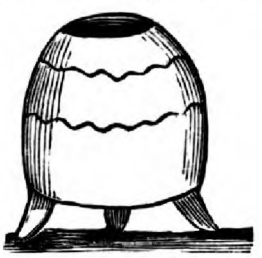


FIG. 58.—Vessels seen in a burial-cave.—FIG. 59.

"There are many markings on the wall back of this one: I think he must have been a chief.



FIG. 60.—Vessel seen in a burial-cave.

"Oh! I see the drawing of a large elk, I think, on the wall. It is very well done for them. (Draws Fig. 61.) It is not near the bodies (2).

"I notice some bats in the cave, that keep flying round near the lights.

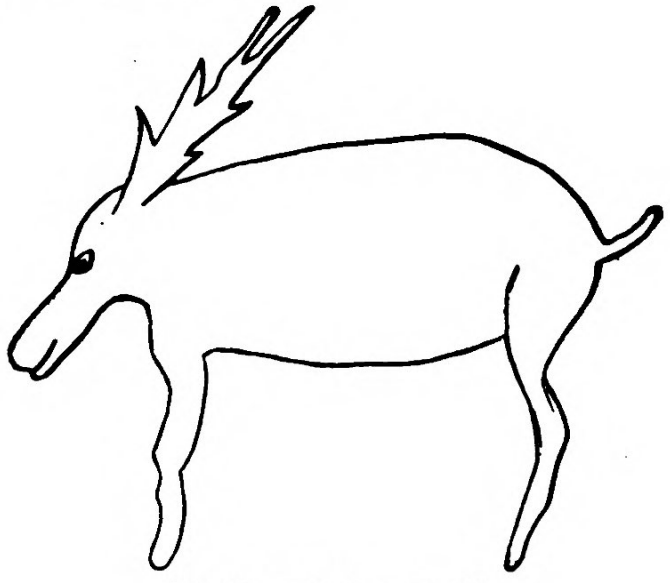


FIG. 61. — Drawing of an elk.

"Now I see a curious drawing of a man on some kind of an animal: I cannot tell what. (Draws Fig. 62.) About like that" (3). ("Are you going

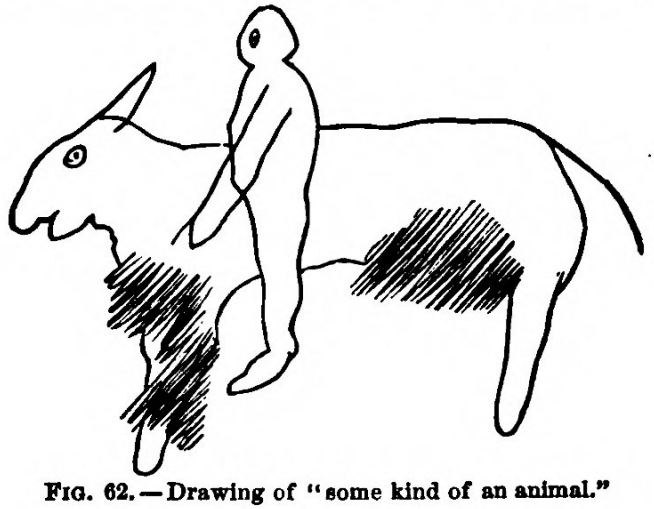


FIG. 62. — Drawing of "some kind of an animal."

round with the party?") "Yes: I keep going round with them. They move slowly.

"There is an animal in here with a long nose, and that has scales on its back, a good deal like an armadillo." ("How large is it?") "About a foot and a half long. It has hair underneath: the scales are like a coat (4).

"They are going out. They have been round the whole cave. A man stands at the entrance of the cave, and every one turns round as he goes out. (It is some kind of ceremony.) When they have all gone, this man himself turns round; and off they go, running in all directions (5).

"Some of these people live above the cave. One of those enclosures is there. There is some difference between it and the other I saw. The houses are of a different shape. (Draws Fig. 63.) I see no draw-



FIG. 63. — House within the enclosure.

ings on any of them." ("How many houses are there?") "Nine. Some of the houses are on legs, and the people are sitting under them."

("What is the climate like?") "It is warm, — like the temperate zone in summer.

"I can see mountains a little way off."

(1.) This is, I think, the place referred to by Mrs. Denton as "a steep, winding path up the hill, along which they frequently go both by night and day;" and the reason for this will be seen when he refers to a settlement of them on the top of the hill above the cave.

(2.) This, from the long head, short neck, and round and compact body, was evidently intended for an elk, or moose as it is sometimes termed. Although the bones of the reindeer have been found in great abundance in the Dordogne caves, I am not aware that any remains of the elk have been discovered there. They have been found, however, in the caves of Belgium and Spain, and may yet be found in the Dordogne valley.

(3.) This is a very strange outline. What animal is represented? Could there have been an animal of the horse kind with a nose as much extended as this represents? It is not impossible: the largely-developed and flexible upper-lip of the horse is probably a representative of a more proboscis-like appendage in some of its progenitors.

(4.) This is certainly improbable, though not impossible. The only animal in the Old World that his description resembles is the short-tailed manis of the East Indies. Man's early and complete occupancy of Europe has doubtless caused the destruction of many organic forms, some of which we know, and probably many of which we do not know.

(5.) At the close of the examination, I asked him if they did not close the entrance. His reply was,

"No: it was too large to be closed." But would not the bodies be mutilated by animals if thus left? So it would seem: but the vicinity of the place may have been so occupied by man, that wild beasts did not exist; or they may have closed that portion of the cave where the bodies were, unseen by him. Broca says, "At present we know of but one burying-ground of the troglodytes of the Vézère. It is that of Cromagnon, not more than five miles from the Madeleine cave. It is under a shelter, and not in a cave. By the side of the corpses were placed carved flints, and ornaments in shells; but there is no trace of a stone door." *

BARBARITIES PRACTISED AMONG THE "CAVE-DWELLERS."

Three days afterward the examination was continued: —

"I see one of those black men dead in some bushes. He was killed in some way. There is a great gash across his face, from his eye to his mouth. He has no clothing on. He has been dead three or four days, I think.

"Now I see a fearful thing, — a man dead on a tree. His legs are tied across, and his hands across. The tree was sharp, and he was stuck on. His hair is tied away up on the pole. He has been on some time, — a month, I should think. (Draws Fig. 64.)

"I see another one now, fixed another way. Some crows are picking him. (Draws Fig. 65.)

* Broca, in Nature, vol. vii. p. 368.

The pole is sticking through him; but he is sitting. On every pole a bird is sitting, — larger than a crow, but black like it.



FIG. 64. — An impaled image-breaker.

"I see another one now; but it is only the skeleton. On each side of it is a snake's skeleton. (Draws Fig. 66.) It lies on a bed, on high poles. I think it was placed there by the man's friends. I don't understand all these things.

"I see another crucified on a cross of poles; and



FIG. 65. — A fearful punishment.

on the poles, where his arms are, small skeletons of rats and mice are hanging.



FIG. 66. — Skeleton on an elevated "bed."

"Now I see a place where some one has been

burned. A skull and leg and arm-bones, and some ribs, are in the ashes. He was tied to a stake, — a growing tree: the stump is there now.

"I have lost it entirely now. It has been gradually going."

What could have induced men apparently so peaceable to be guilty of such barbarities? Or were they the sufferers? — and, if so, what could they have done to arouse so terribly their foes? I was very desirous of solving the mystery.

THE INTERIOR OF AN INHABITED CAVE.

On the same day, Mrs. Denton made a second examination, knowing nothing of the specimen, or the results of Sherman's examinations.

"I see the same place, or one very much like it, that I saw the other day, — the same opening into a hill, the same door of interwoven sticks, high as a man's head, and considerably wider than a common door.

"Outside, and near, I see several posts, each with three projecting sticks at the top, and three about half way from the bottom. These forks are about three or four feet long, and are used, I think, for hanging objects on. One is lying on the ground.

"There seems to be quite an extensive wood stretching over and beyond that hill.

"I am inside of that place now, and can see the door at the entrance. What a terrible smell! There are both animals and human beings here, and the stench is intolerable; but they do not seem to be

annoyed by it (1). They are a jolly set. There are numbers of noisy, rollicking children here; and there is constant gabble and jabber, first in one part, then in another, and then all through the place. It is a large place, and is divided into what appear to be regarded as separate apartments by sticks that have been stuck down into the floor, and are about two feet high.

"The men are large, coarse, and hairy. They are not the largest I ever saw; but they seem very strong (2). So also do the women. But I see none of them with sufficient distinctness to describe them fully. Yes, I do see three or four children. They have broad, short faces: the space from the brows to the cheek-bones is especially short. They are very dark; but I have doubt of its being the natural color. They have full forms, and are quite fat.

"I see a number of men with some kind of animals. They are, perhaps, a quarter of a mile away from this cave. The persons have something on their heads, which would be quite high but for a string; I judge, of bark, that is lashed over the top, and tied under the chin: this divides the front and back each into a kind of puff. Beyond these men and animals there are people busy at work, apparently; but I cannot tell what they are doing. They seem to be in a wet or marshy place. I think I see water there. Something looks bright when the sun shines on it.

"There is an animal here that has a tusk on each side of the mouth. It is larger than the common hog, but looks somewhat like it.

"There is also an animal, with long, drooping ears,

that has a shorter snout than the animal with tusks. This is like the hog also, — fat, thick, and short (3).

"I see several animals with horns similar to those of the elk, but somewhat shorter, I think.

"The climate seems warmer than this; but the temperature is more even. I do not think the extremes of heat or cold that we experience are usually felt there. The climate seems modified by the ocean (4).

"I see the people again. I think some of them could live out of doors, the year round, without much suffering. They seem very tough, and could better endure a lower than a higher temperature through the greater portion of the year. A hot climate would change them very considerably.

"The animals under their control are to them what our domestic animals are to us.

"I see a head now more distinctly. The face resembles the children's; only it is larger; the complexion seems to be brown with a yellowish tinge."

(1.) Referring to these "cave-dwellers," Broca says, "The troglodytes, after their meals, left the bones spread about the floors of their caves. In a warm climate, these remnants would have exhaled an insufferable odor. . . . Cleanliness was not the predominant feature of the men of those days." *

(2.) This agrees very well with the skeletons hitherto discovered. Of them Broca says, "Their stature was very lofty, and far superior to our own. . . . The volume of the bones, the extent and

* Nature, vol. vii. p. 427.

roughness of the surfaces of muscular insertion, the extraordinary development of the branch of the jaw-bone where the masticatory muscles are inserted, prove an athletic constitution."

(3.) Prof. Rütimeyer believes that two races of hogs are represented in the remains discovered in the beds of Swiss lakes.*

(4.) The general supposition has been, that the climate was considerably colder than in the same latitude at the present day: but these examinations indicate a climate very similar to that of the present; though from the presence of the reindeer, ibex, marmot, and chamois, whose remains have been found in the caves, it seems highly probable that the climate had previously been considerably colder; and with this agree Mrs. Denton's subsequent remarks. Many fluctuations of climate, extending over long periods, seem to be indicated by our examinations.

AN ARTIFICIAL CAVE.

Five days afterward, the specimen was examined by Sherman again.

"I do not know where I am; but it is some place that seems to be underground, — a long, low place, high enough for a man to stand up in. It is made of stones piled up, and dirt over them. It seems to be more than a hundred feet long, and has a square top made of flat stones. It receives light from the entrance. There is a dark place at the end, that seems like a natural cave. When you first get in,

* Lubbock's Prehistoric Times, p. 192.

the roof is low, but higher farther in (1). I can hear water trickling down in here. A stream of water about two feet wide comes out from the rock, and falls into a hole in the rock again.

"I think it must be some place where people are buried. I see mounds on the floor, as if there were bodies underneath. There are no stalactites; though it seems wet enough.

"This leads through, and out again, with just such another passage. There is a hill over the natural part of it.

"There is an enclosure for cattle, made of sticks driven into the ground. A river runs on one side; and this semicircular fence is on the other.

"I see some people in a large, round hut with a conical roof. It is as much as thirty feet in diameter. They seem to have some idea of hats. They are curious-looking things, — something like Chinese hats, — and, I think, made of plaited palm-leaves." (Draws Fig. 67).

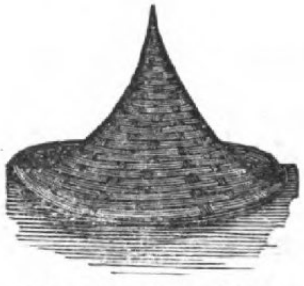


FIG. 67. — Plaited hat.

("Are they the same people that you saw before with this specimen?") "No: they do not look as well. Their foreheads recede more; and their lips stand out farther" (2). (Draws Fig. 68.)

"Some of them have a very little beard.

"They are quite far along in some things. They



FIG. 68. — Negro among the "cave-dwellers."

carry water by a crooked stick on the shoulders, and an earthen vessel tied to each end. (Draws Fig. 69.)



FIG. 69. — Yoke and jars for carrying water.

"They drink — as I have read of the Caffres drinking — by slapping the water with their hands into their mouths out of a large dish. They get quite wet. There are four fighting about it now. They slapped water at one another, instead of into their mouths. They kick one another. One kicked another, and he fell down. The other ran to get a

drink; but the man down caught his foot, and pulled him down."

("What is that large house made of?") "Sticks and mud, I think.

"While they are quarrelling, a man comes out of the house, who is a chief, I think, and kicks one. They have walked off. He drinks more slowly.

"I see several more houses across the river, about a mile and a half off, down the river (3).

"Some are fishing in the river." ("How large is it?") "It is quite large, — twice as wide as Charles River is here.

"Down where the houses are, the river spreads away out into a lake (4).

"They are fishing. They have some kind of a net made of strips of hide tied together. They understand the business well: two pull the net, and others splash at the sides, so the fish won't run past. I see a good many in."

(1.) The cave was not large enough for their needs, and they increased its size by forming an artificial one. Mrs. Denton probably refers to this in her first examination as "a long, low structure, mostly of rocks and clay."

(2.) These were probably slaves, that had charge of the cattle.

(3.) There were several settlements down the river, on both sides, within from two to four miles.

(4.) At the present time, between La Madeleine and the Upper Laugerie (the next lower settlement), there is a lake-like extension of the river, which may at that time have been considerably larger.

BEE-HIVE SETTLEMENT.

The next day Mrs. Denton continued her examination as before.

"There is a stream near here, and hills on both sides. I see people on the stream, in a boat that is high at both ends, but considerably higher fore than aft. I see a great many people; but they change — that is, they come and go, gather and disperse — so rapidly, that I cannot describe them individually. They are in and out of the stream, over and around the hills, crossing the valleys, and through the fields and woods, and all around.

"I see something about four times as large as a common axe, and resembling an axe somewhat. It is of stone, I think, with an eye for a handle. The handle is of wood." ("How is it fastened?") "I think it is wedged (1).

"I see in the distance objects that look like little huts. They are in an open field near that stream; and paths, or lanes, lead from one to another, except where they are very near together. They seem to be made of clay and sticks, are round or conical, and almost or quite of a sugar-loaf shape. There are many of them made after this particular pattern; and, from where I stand, they resemble a *bee-hive settlement* more nearly than any thing else I can compare them to. They are stationed at varying distances from each other; and, while they seem to conform to one general idea in figure and structure, they are varied in finish, and in conveniences for ventilation, light, &c.

"I think they are the separate houses of indi-

vidual families, — places for the gathering of the family at night principally; though they are sometimes here in the day. Generally, however, during the day, the children are left, in a great measure, by themselves; a few older people exercising general supervision.

"Many of the huts indicate considerable taste. The openings for light, and the entrances, are squared and smoothed in an orderly and somewhat artistic manner."

GARDENING AMONG THE "CAVE-DWELLERS."

"There is even an attempt at gardening; and they have implements with which they dig the soil: they are made of wood and stone; and, though coarse and rough, their manufacture indicates some considerable advance in the skill of labor.

"They raise roots of some kind. Some of these are different from any thing I have ever seen. One tastes something like the artichoke, but is different in form, and manner of growth: it grows more like the ruta-baga. The leaves are different, however, and are thick and stiff, with a sweetish, watery taste, and, when mature, fall off, leaving a dry, grayish mark, exactly the shape of the leaf, at the point of connection with the root. The root, when fully matured, is easily masticated; and its taste and consistence is singularly like that of a boiled chestnut. It was eaten green and ripe. When green, the skin was tender and crisp, and was eaten with the root: when ripe, it was tasteless and tough, and was generally peeled off. They grow of all sizes, — from

that of a small to that of a very large ruta-baga. The flesh is white when ripe. They are greatly improved by even the unskilled cultivation that these people give them; and this they seem to have learned. The root seems to be a native of the country (2).

"They also cultivate the cabbage, and use it quite extensively (3). I do not find the potato (4).

"There are fruits of several different kinds. I notice particularly the wild plum, and a small, hard sour apple, that is also wild. The people do not seem to have made any attempt to cultivate them. They gather them in their season as we gather nuts.

"I see a pile of those tools. They are at the back of one of the huts, and lie with the head or axe part up, and the handle down, as if on a slope. They are sheltered somewhat (5).

"Some of their structures, made of clay and sticks, are of great length, with several entrances, or door-ways, as if designed for many families.

"I see an animal something like a 'coon; but I do not know what it is (6).

"I cannot forget that root. I sense the sweet and rich but mealy taste when ripe, and juicy and cool when green. It was good raw, and was, I think, generally eaten raw when green, and both raw and roasted when ripe.

"I seem to be in an entirely different place now. Before me lies a long, dim, gloomy road, lying apparently through a thick wood, and, I think, fully two or three miles in length. I can see the sun shine on the hills beyond.

"There are similar huts here, and made in the same way; but there are not half as many of them: I do not think there are a fourth part as many.

"I am back again where I was before. There seems to be a place in a hill near here where they bury their dead. It seems to be dug out, — an open, roomy place. They do not bury their dead in separate graves: they place them in there together.

"They are quite communistic in some respects. They have a good deal of social feeling, and great care for the members of their settlement. There is a good deal of kindliness among them: they are superior to many of the ancient people in that respect. There is a hearty good will, that extends even to neighboring settlements. They have communication with them, to some extent."

(1.) I am not aware that any implement resembling this has been found in the caves; but, in Denmark and other European localities, they are not uncommon.

(2.) I know of no root of this description. Just as the mammoth and other forms that then existed have disappeared, so may many vegetable forms, but leaving no solid parts behind by which their previous existence might be known.

(3.) Darwin says that many useful variations in the leaves and stems of cabbages "have been noticed and preserved from an extremely remote period; for cabbages were cultivated by the old Celts." *

(4.) The potato was unknown to the Old World till the discovery of America by Columbus.

* Animals and Plants under Domestication, vol. i. p. 390.

(5.) These people must have dwelt in the valley for a long time; and their condition must have improved during that period. I think the examinations represent their condition at periods widely separated in time. It would take a long time to work out their whole history.

(6.) Probably the marmot, which has been found in the caves of the Dordogne.

WORSHIP OF THE "CAVE-DWELLERS."

The next day the specimen was examined by Sherman again.

"I see some of the same kind of people walking in a circle, single file, round a place covered with clay, and very smooth. It is some kind of a ceremony. There is a small stick driven down, and a red feather on it: when they come to that, every one jumps over it. It is only about a foot high.

"They have been round now three times. A chief pulls the stick up (I think he put it down), and goes off; and the whole line follows him.

"There is a post which they have made into a figure: it is quite rude. (Draws Fig. 70.) It is stuck in the ground: there is only the outline of the arms. Every one comes to this, and jumps high, and bows low, and goes on. Two stand near with jars of water, which they pour on the head of it with their hands, patting it as if they intended to refresh it.

"On the back of the figure is the stub of a limb (it was made out of a tree); and they hang the jars on that.

"They are moving round, — following the chief with the red feather. He made some kind of a prayer, I think, when he came to the image: he stopped longer than the rest, and said something."

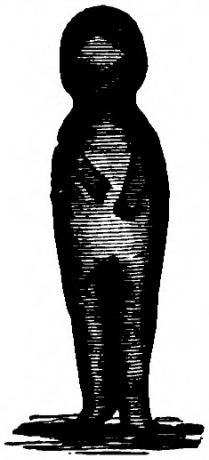


FIG. 70. — Idol of the "cave-dwellers."

THE IMAGE-BREAKERS.

"I see some rascals now, coming along after the others have left; and they are pelting the image with stones: they have smashed both the jars. They are different from the others. Their lips are not near as thick: their faces are more perpendicular. They have knocked it down now. It was stuck in quite deep.

"Oh! the other fellows have seen them; and they are running after them, and hallooing. They are fairly frothing at the mouth, they are so angry: they have great clubs. (Draws Fig. 71.)

"They have got one of them. One fellow struck him such a blow on the head, that it broke his skull in. Well, well! That is the first fellow I saw the other day, lying with his face cut: I recognize him. They let him drop, and ran for the others. They are so angry, they run fast.

"Well, that is strange! It changed, and I saw immediately what I saw before; only the bodies are fresher.* They are the same people that knocked the idol down (1).



FIG. 71.—Club used by the "cave-dwellers."

"I see another one that I did not see before, suspended from a tree, by a strap attached to his leg: it is made of strips of skin tied together. There are monkeys up in the tree, looking at him."

("What are the monkeys like?") "They are quite small (not larger than a rabbit), of a slate color, or like a Maltese cat, and have quite long tails" (2).

MAKING A NEW IDOL.

"I see them making a new idol. What a job! They rub the wood with a stone and coarse sand, and wear it away into the shape they want. They have a bigger one this time. There are as many as half a dozen at work at it. (Draws Fig. 72.) They have not got the head rounded off yet. They are hard at work. They use sharp stones where it is necessary to cut, as for the eyes and such like.

"I see a small one, that is well done for them, with red feathers stuck round the head. (Draws Fig. 73.) One arm is a good deal longer than the other. I cannot tell what that is for." ("What is it made of?") "It is made of wood, and stuck in the ground: there are no feet.

* See p. 365.

"I see some of the same men that were struck on

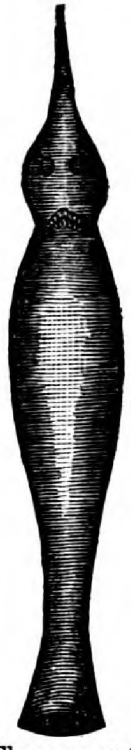


FIG. 72. — The new, unfinished idol.

the stakes, — a great number of them, — armed with



FIG. 73. — The small idol.

stones and shields of some kind, made of white-wood.

The idol-makers are trying to get the little one up to carry it off; but they cannot do it. Now they are running for life, and the others after them. Some stopped to smash the new one they were making. They have completely defaced it with big stones.

"The first ones did get the little one up, and they are carrying it off: the others are pelting them. They throw stones up so as to fall on their heads.

"Just then they surprised a poor fellow in the bushes, who did not appear to know what was the matter. They made a hole in his back. They throw so hard, the stones go sometimes into the wet earth. They are not satisfied to kill him, but crush him with great stones.

"I see the others carrying off their god. One has it on his back, while he holds it by the arms.

"They are going through one of the houses now. They make rags of it in a short time. When they hit it with a stone, it jarred the whole thing. They jarred the sides so that the roof fell in.

"That fellow has dropped his god, and run: he found he was lagging behind some.

"They have seized the god, turned it upside-down, and split the legs with a big stone. (The man that dropped it carried off the red feathers.) The head was knocked off; and they have taken that for a trophy. When they come to where there are stones, they pick them up. Some fellows do nothing but carry stones.

"Gracious! They were going after them, and they came on a bees' nest; and now they have to run. The bees are piling out of a great nest which hangs

on a tree, like a hornet's nest. (Draws Fig. 74.) They are stoning it: some stones went through it.

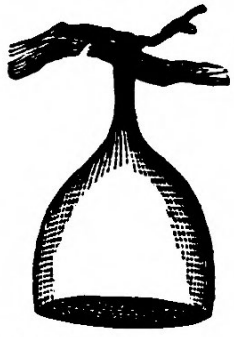


FIG. 74.—Hornets' nest.

Some that are stung seem to be in great agony. They are almost entirely naked. There is a small, deep brook; and they are making for that. I can see the bees in a string from the nest to them. They are jumping in head first. One fellow struck on another's feet, and sent him away down. Another jumped astraddle of one. There is quite a bank here. Some jump in, and some fall in. The bank is red clay, and slippery.

"I can see the white marks on their backs where they were stung. They are scratching their necks, and rubbing their legs, as they go along."

(1.) This seems to have been as unlooked for by him as it was by me. Their treatment of the iconoclasts does not seem to agree with Mrs. Denton's description of their character, if her description refers to the same people, as I suppose. But people called Christians have been guilty of torturing others in ways almost, if not quite, as bad as this.

(2.) No remains of monkeys have been found in the caves; but, unless they were used as food, it is

not probable that they would be. Their presence indicates a warm, or at least a comparatively equable, climate. They have been seen repeatedly by psychometers in connection with the early men of Europe; and I venture to say that the time is not distant when their presence in Central Europe with the men of the early stone age will be recognized by archæologists.

THE DWELLINGS OF THE IMAGE-BREAKERS.

The examination was continued the next day. I said to him, —

("Find the image-breakers, and discover where they lived, and how.")

"Well, I seem to be where you wanted (1). I see those other people now; but there are two kinds here: one has long, straight black hair; and the other curly. Their huts are curious; different from all I have seen, I think. (Draws Fig. 75.) They have a bee-hive top and an arched door.



FIG. 75. — Hut of the image-breakers.

"The long-haired people have a belt of hair round their middle. The hair is left long in some places, and cut short in others. (Draws Fig. 76.) It is fastened by putting one end, which has a hole in it, through a hole in the other end; and then a piece of stick is put into the hole to hold it. These people

are as dark as the others, and have as sloping foreheads. I see very little difference, except in the hair. The people seem mixed.

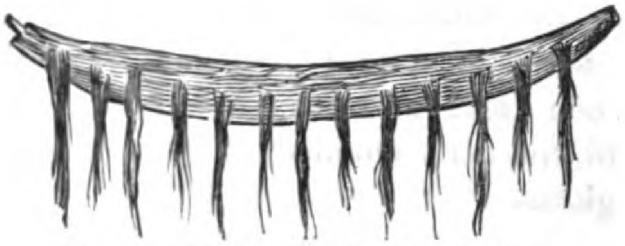


FIG. 76. — Belt worn by the image-breakers.

"Their houses are not in an enclosure. There is quite a village here between two low hills. There is a brook near, flowing rapidly from a hill.

"There is nice clayey ground here, quite level, where nothing grows. It is all trodden down. There are footprints all over it."

("Go into one of the houses, and see what is in it.")

"There is a small ladder inside, made of two small trees, and vines for steps, tied on. The houses are made of clay, except the roof, which is made of woven grass, and long, thin leaves.

"It is very bare inside; only a few jars. It is very warm in here.

"I see one house where the clay archway has fallen down, and they are mending it. Another one is propped with a stick: it seems likely to fall.

"Now I see a large trough made of baked clay, about six feet long, three feet wide, and a foot and a half deep; and they are boiling fish in it, — one very large, and several small ones, of the same kind as I saw before. They have a fire underneath the whole

length. The trough is twisted out of shape; done when it was baked, I think.

"There is something the matter with it. A small hole let the water out; and a man that stood near threw a piece of clay right on it, and stopped it up.

"They have a curious way of building their houses. They make the tower part first; and the upper part is made on the ground, and lifted up, and stuck on with clay. They have long poles, and slide it up. It is not very heavy.

"I see about a dozen round a bees' nest, picking out the grubs, and eating them raw."

("Are there any animals about?") "Yes. I see what looks like a kitten: a little girl has it. I see bones of animals that they have eaten.

"There are wild fruits here; some that look much like lemons, others like oranges, and others like small apples, — crab-apples.

"One of the men is up a tree, eating some red fruit that has small stones inside. He had a handful of the stones, and threw them on the head of a man that was passing.

"There are a great many locusts and grasshoppers here."

("Go down the river.") "I have come to a lake (2), and I see what look like Swiss dwellings: piles stand up here and there; but they are decayed. There is a house on the platform; but the house is on one side. Some of the props have given way, and it is ready to fall in. (Draws Fig. 77.) That is all that is left of it (3).

"I went to go back to that village, and found another place, and a white man, who has pants made of some

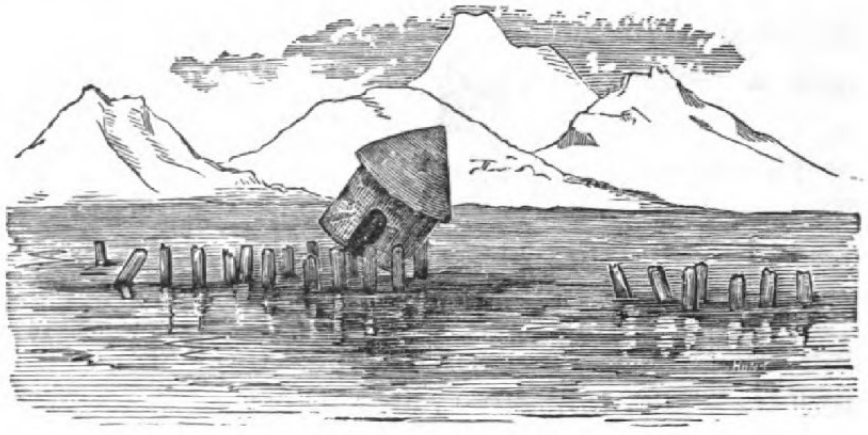


FIG. 77. — Lake-dwellings in the Dordogne valley.

coarse cord: they are white and wide like a sailor's. His hat is made of palm-leaf, with a coarse mesh about an inch broad. I fancy he is a sort of trader. All is changed; but the same brook is still there. There are some colored people here, but not as dark as they were: they seem to be a mixed breed. I can still see the old look about them; and they are descended from them. I see one old woman who seems to be a hundred years old.

"The houses have sloping roofs, and are made entirely of thatch-work; and have windows, but no glass. They have the look of modern houses, and are considerably larger than the old ones. The roof is very thick." (Draws Fig. 78.)

("See what is in them.") "I see bows and arrows (good ones), and paint on the wall to represent fancy-work, — red-and-blue squares; and they have sections of trees for chairs.

"I see a pretty good thing for digging out clay. It represents two hands joined together, with the fingers



FIG. 78. — House made of thatch-work.

united to form a shovel: it is made of wood. (Draws Fig. 79.)

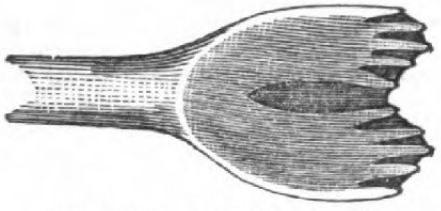


FIG. 79. — A wooden shovel.

"Several are getting out clay, and making a fire-place. It is cylindrical, and has a hole underneath. It is as much as five feet in diameter.

"They make clay into brick; and a man draws a small pot on every one: he grooves it with a sharp stone. Several are standing round, looking at him: they think it smart. They do not share the work equally: some do all the loafing, and some all the work."

("How are they dressed?") "They have cloth, made, I should think, of the inner bark of some tree: it is woven. It seems to have been rubbed till it was soft.

"I see an old man looking round here who is tattooed in blue. I think he must be a chief. (Draws Fig. 80.) When I first saw him, it looked as if he had spectacles on.



FIG. 80. — A tattooed chief.

"I see some men going down to the lake with a boat on their shoulders. The outline of it is handsome."

(1.) At times the will appears to have no control over the visions presented: at other times there seems to be a direct connection between them, as in this case though, even then, the power of the will is limited, I think, by the actual facts of the case, that only appearing which had at one time an actual existence.

(2.) This may have been the same lake observed during the previous examination, but at a different period.

(3.) The practice of erecting houses on piles driven into lake-beds was not confined to Switzerland. The remains of similar dwellings have been found in most European countries, and even in America.

THE RELIGION AND LANGUAGE OF THE "CAVE-DWELLERS."

WRITTEN BY MRS. DENTON AFTER AN EXAMINATION.

"These people are thin and tall for their size: their limbs and faces are long. They are a very peculiar people. There is a good deal of refinement about their feelings, compared with savages; and yet I do not notice any anxiety in reference to surrounding savages.

"There seems to have been some design in the grouping of their huts; but I do not get the idea. There are, I think, from two to three hundred, or more, of them.

"I think them a very reverent people, a very religious people: they seem to have regarded the sea and the sun as the two great ruling powers, — the sun as a good power, and the sea as a power of which they were in dread. The wind was to them the breath of this power: they called it the breath of the sea, not in these words, but in such words of their language as signified this. At times they were very much in dread of it, as if it had some terror for them other than mere physical disaster.

"It seems to me I can get some of their language in connection with this feeling about the sea. I get an idea of the sounds they used, but cannot, perhaps, group them correctly. They seem to me to *implore* the sea. The uttered sounds are, '*Ah, ah-bah, dah-lah-vah.*' There is a sound between the *lah* and *vah* that I do not get distinctly. Yes, I get that sound now: it is *rah.* The sentence is, '*Ah, ah-bah, dah-lah-*

rah-rah.' This is uttered in an imploring tone; and the idea connected with it is, 'O sea! be satisfied.'

"One of their religious exercises consisted in collecting together, and marching in a circle around a pole ten or twelve feet high, upon which something is secured at the top. It is of considerable size, and I judge it to be an image of some kind. Yes, it is an image of wood, — the head, body, and lower limbs made to represent a human being. Whether it has arms or not, I do not know; but from the shoulders extend rude wing-like appendages of great length and breadth. Each wing appears to be of one piece; but, if so, it is thinned and grooved on one side in imitation of long, broad feathers. The figure is fastened to the pole by the legs, I judge; while the body, which is above the pole, inclines forward, and the wings are extended, giving to the entire portion above the pole a protecting or hovering attitude. Over the brow are fastened long, large, stiff black or very dark feathers, in such position, that, whatever the weather may be, it has the appearance of bravely breasting the storm, the feather part being turned backward toward the shoulders. Each edge of every one of these long feathers meets the edge of the one next it; while alternating with these, and fastened with them above the forehead, are bright scarlet plumes, that entirely hide the quill portion of the large feathers.

"This worship, or rather ceremony, — it cannot, perhaps, properly be called worship, — appears to be in some way connected with their idea of the sea, or of the storms which they seem to believe are sent forth by the spirit of the sea. There is much solemnity

about them generally; and their religious services are marked by an almost excess in reverence: their ceremonies are not, however, as demonstrative as those of some ancient people.

"There were a great many people in that circle, and the circle was large.

"It seems to me on the Eastern continent, — somewhere in Europe, toward the south-west.

"I see now an altogether different people, that have, apparently, no reverence for any thing; and for all that the first people revere these manifest only contempt. They have given the others a great deal of trouble (1). They manifest a spirit of mockery for all that is held by the others as sacred in their ceremonies, their worship. They ridicule their religion; and their contempt is positively oppressive to the spirits of the worshippers. They are different in form, in color, in features, in habits of thought, in almost every respect, from the people I at first saw. They are egotistic, unreasonable, and absurd. I do not, however, think they are destitute of religion; but I cannot tell what their religion is. They know too well where to strike the blow at the faith of the others that will be the most keenly felt; and, in striking it, they study to produce the keenest possible anguish.

"These first people are some distance from the sea: many of them never saw it; but they cherish the feeling of their fathers about it, and listen to tales of its grandeur, its restlessness, and of the voices that continually moan and complain from its depths, with all the reverence and awe that it is in their nature to feel."

(1.) I think the people referred to by Mrs. Denton must be of the same class as the image-breakers seen by Sherman.

It would be very interesting to trace the origin of the "cave-dwellers" perhaps back to the rude hunters of the Somme valley, and also to trace their extinction, perhaps, by an irruption of a more war-like but lighter-complexioned race from the Far East; those who were spared from butchery amalgamating with their conquerors, and modifying them.

EARLY OCCUPANTS OF GREAT BRITAIN.

AUG. 2, 1870.

I requested Sherman to see, if possible, what the first inhabitants of Great Britain were like. After looking at the map of Europe for a minute or two, he closed his eyes, and said, —

"It seems as if I could see my old tracks, like a white line, where I went to England once: I never noticed that before. I am there. It is very wild in one place where I am. There are great trees, and many shrubs, and a great many white rabbits. There have been people in England for a long while.

"It astonishes me how long there have been people in this place. I see them when they look like brutes. They are all brown. They came from another country, — from France. They are very tall, and very big all over. They have very long beards, and very high cheek-bones. Their mouths stick out, and their teeth meet slanting. Their hair is black, and they have black eyes. They fish more than any thing else. They live all round the coast. They don't fight as much as I should think they would.

"There is a better class of people in the middle of the island. They are very tall, but not as stout built. Their mouths do not stick out any more than ours; but they are of a brown color. These people have rounder heads than the others, and their foreheads are larger. They make cloth with small machines made of wood. They have no shuttles, but put the thread in between with their hands. Their houses are strongly built, of large timber.

"I am going back now. I can see where the first people came from that were ever in Great Britain. They came from the south of Sweden on a raft. They were drifted here. They could not get ashore in their own country; and the waves swept them on: but it took them a long time. There were nine of them; two women. They had food on board. It seems as if they were going for pleasure on the water.

"Well, that is curious! As I go back, I can see the peat rise up and make trees. I see the pieces that have fallen off come up, and fit right in.

"They are very large people; very tall. They landed on the coast of Yorkshire, I think (1). It took them a long while to land. The raft was large and strong, and they had cooking utensils on board. I see some fish in a pot. It looks like a good pot for such an early time."

(1.) Even to-day, according to Johnston's "Ethnographic Map of Great Britain," the population of England is Scandinavian from the mouth of the Humber, along the coast, to the Frith of Forth, which includes the coast of Yorkshire.

The Scandinavian population has been noted for

its maritime adventure from the earliest historical period; and before ships were dreamed of, or boats made, rafts were probably used by their primitive ancestors for a long period of time.

I do not suppose that those Scandinavian castaways were the first inhabitants of the island. It would require a very careful psychometric examination of Great Britain by many independent psychometers to work out its ethnographic history; but it will be done. Charts will be constructed, showing the character of its population at various times; and its present condition will be explained to the satisfaction of all thinkers: but this will be work for future generations.

ANCIENT AMERICA.

It is not very long since it was believed by many, even intelligent persons, that America was originally settled by the lost ten tribes of Israel. Others, who were disposed to grant to the occupiers of the continent a greater antiquity, supposed them to be the descendants of those ancient sea-rovers, the Phœnicians; and all seemed to be agreed that they must be the descendants of races familiar to us in the Old World. Recent archæological discoveries give, however, as great an antiquity to man on this continent as on any other, — if not, indeed, a greater; and it is, perhaps, as reasonable to suppose that the descendants of the New World peopled the Old, as that the descendants of the Old peopled the New.

Our psychometric researches indicate an enormous antiquity for man on the American continent, and an advance in general form and brain-capacity, and

modification of color, since a very early period; while there seem to have been, at a very remote time, at least two very distinct populations, differing, in fact, more widely than any existing aborigines of the continent.

I had intended to give some delineations of the mound-builders, and shown their connection with Mexico, but have concluded to leave them for another volume.

FIRST INHABITANTS OF THE AMERICAN CONTINENT.

Sherman having become, to a great extent, independent of specimens, I asked him to see what the first men on this continent were like.

"I will take an Indian, and keep going back. Well, I have got to where I can see but just three. They do not look like Indians at all. They are not the same color. They are black. The hair is very long, and has a reddish color, but black toward the roots. Their teeth stick out, and don't come together; and the mouth sticks out, — something like a monkey's. Their feet look more like hands than Indians' feet do. They are short. Their arms are very long. When they are sitting on the ground, with their legs out, their hands reach over their toes. I see another gang now. Why, they crawl up trees almost like monkeys! Their bodies are all covered with hair. They stoop when they walk. They have tremendous strength in their arms. They carry clubs, and practise on the trees as they go along, and bang the bark off. They are very filthy. They found some dead animal with bugs and worms in it; and

they are eating that. I see them rip the skin off, and scrape the flesh off the inside with their teeth.

"There is a kind of sour fruit that they split and eat with this flesh. It is actually full of worms. The fruit is white, and spotted red: it grows on an oak-tree, and is made by some insect (1).

"One of these men must have got hurt awfully at some time: there is no flesh on his fore-arm from the shoulder to the elbow. I can see the bare bone. He moves it with the other arm. The rest of the arm looks like a mummy's. Some of the others are looking at it. It is his right arm. He does not seem to care a great deal about it. They do not seem to have any home. They sleep in hollow trees and such places.

"I know now how his arm was injured. He was fighting with a bear; and the bear tore the flesh off, leaving just a little; and that died, and the arm became all dead. The bear lived in a large cave. It was as large as a cow. The man was not afraid, but went up and hit him with his club. Two others helped him, and they killed it at last. They have clubs with knots and thorns on them: some of them are very large. When that man hit the bear, it was on the nose, and there were dents in it. The blow broke his nose. These men must be very strong. It was a she-bear, and had young ones: they came after her like pigs after a sow. The men killed the young ones after.

"That man sits and picks his arm, taking off loose pieces. It seems to be west from here where I am, — about where Kansas is, I think."

At the close of the examination, in answer to questions, he said that their heads sloped back from their

eyebrows. The middle of the face was free from hair; but that which hung from the arm-pits was very long.

(1.) Evidently the oak-apple, which grows upon the stem or leaf of the oak after it has been punctured by a small fly. Eggs are deposited in the puncture; and the apple which springs from it serves as food for the larvæ of the insect.

EARLY RACES OF AMERICA.

The following description, given subsequently by Mrs. Denton, from a rude weapon of silicious slate found near Framingham, Mass., seems to refer to races still lower in the scale: —

"I see beings that are short, thick, and ape-like. They are angular; and their hips will not allow them to stand straight. The shoulders seem bent; and they are very dark-colored. I see one that looks slimmer than the first. He is not hairy; his eyes slant down toward the nose; the face is broad and flattish; but the chin recedes very much.

"There are two kinds of people here, both perfectly naked. In one the chin recedes, and the nose has a singular prominence; while the lips are very protruding. The other kind is short, thick-set, and black, with heavy features. The hair sticks out in every direction. They are stouter than the others; have a large, flat nose, and flat face, and eyes more straight than the others."

A HAIRY, GIGANTIC INDIAN.

The following examination was made, about three years ago, from a fragment of what was said to be a

mastodon-bone, dug out of a swamp near Alloway, in Salem County, N.J. It was made by my son Shelley, at that time eleven years of age. His psychometric vision is intermittent: at times he sees with great clearness, but only for short periods.

"I see a man all dressed in the skins of beasts. He is a stout man, and has a club in his hand, with a round knotted ball at the end. It is a kind of sandy place where he is, — a little plain. Off a little way is a hill with a few trees on it; some half dead. The man is sitting under a large tree that looks like an oak. He is hitting the tree with his club, and making dents in it. There are pieces that stick out on the ball; and he stuck them into the tree when he struck it.

"His hair is black, and very long and coarse, and very irregular. It looks almost like horse-hair. He is walking now. What a big fellow! He whacks almost every tree he comes to with his club. He is very strong. He is seven feet high, I should think, and muscular (not fat), and looks healthy.

"It is coming on night; and he is getting down young trees, and making a hut by sticking them in the ground and bending them over. He has bark on his feet; and he goes round and pushes up the dirt around the hut. He covers it with bushes, and leaves a hole for the smoke. He is making a fire by knocking two stones together, and catching the sparks in dry grass. He blows and blows, and gets a good fire. He is sitting at it now. It is pretty cold. It seems to be the fall of the year, and a long time ago.

"He is covered with hair, very long. It is two

inches long on his arms and legs. It must help to keep him warm.

"It is dark now; and he is lying on grass, by the fire, asleep, with his club in his hand. He stopped up the entrance of the hut with some boughs. He has a few coarse hairs on his chin, and finer hair on his neck, but no mustache or whiskers. He has a bruise on one of his fingers. It has been nearly cut off, and is not well yet. He sleeps soundly. The fire caught one of the boughs near; but it has gone out.

"It is pitch-dark now; no moon nor stars.

"He has hair on his chest, — a regular turf of hair. His shoes are made of bark, with some strings of tough bark to tie them on. He cuts out a number when the bark strips easily."

His description agrees well with the present Indian type, with the exception of the gigantic size and hairy body, which may have characterized it at some distant period. I have seen Indians in the West making at night such shelters as he describes.

I had no anticipation that any human occupants of the country would be seen; but, as we now know that man occupied this country with the mastodon, it is not unreasonable to suppose that this may have been the case in New Jersey.

A MASTODON IN A SWAMP.

A week afterward, I tried him with the same specimen again, he still knowing nothing of the character of the specimen. He saw the same man hunt and kill a wild animal, and then go to sleep upon its skin. The scene changed; and he said, —

"I am in a very thick forest and swamp now. Oh! I see an elephant. I am sure it is one, — an awful big fellow! It has two tusks. It puts its trunk round the tops of the small trees, and sweeps them into its mouth.

"In this swamp are muddy places, where the elephant sinks in up to the top of his legs. Don't he groan to get out? There is a little creek running through here (1). The trees are very thick, except where it is so very muddy. It looks like nice hard ground; but any heavy animal would sink in it. All that bears the elephant seems to be what it presses down with its big feet. It is out now, but looks as black as if it had been painted (2). It is feeding on the leaves now."

(1.) A small creek runs through the swamp at the present time; and in it trunks of trees, and bones of various animals, especially elephantine bones, are very numerous.

(2.) Several mastodons and other animals doubtless perished in the swamp in consequence of thus sinking in the mud.

THE MASTODON AT HOME.

The same specimen was tried by Sherman about the same time, he being equally ignorant of the character of the specimen.

"I see some elephants with this. It is very gloomy here; yet the sun is shining bright. The air is bad to breathe. It smells gassy, like sulphur-gas. It produces a choking feeling. These animals do not mind it. They are feeding on grass. There are hundreds of them scattered around.

"This is a place where the water comes up sometimes; and, when it goes down, they come and feed on the grass. They have long tusks, that curve at the ends. They are more hairy than our present elephants. I see their ears flap up and down as they raise and lower their heads. They seem timid. They raise their heads, and look around, every now and then, when they hear a noise. They have larger eyes than most elephants. The tail is short, — not more than a yard long, — and has a little bunch of hair at the end of it. The tail can be twisted, like that of a pig.

"I see a very large, hazel-colored bear trying to get up to them without being seen. It is the largest bear I ever saw. One of the old fellows saw it, and straightened his tail out like a poker, and snapped it, and ran; and the others all ran, snapping their tails as they went like a bunch of fire-crackers.

"The bear is rubbing its paws with its nose, and looking at them away off. Such a tramping and rushing as they ran! They made the ground jar.

"They always go in troops; and one holds its tail out, when it suspects danger, till it is sure; then it cracks it, and away they go.

"There is a stream here, about twenty feet wide, and eight or ten feet deep.

"An animal of the cat kind, with a large round tail and spotted coat, is trying to creep up to the elephants.

"Now it is all dark."

As I think this was in the human period, I give the next, though no human beings were seen.

A great many species of elephantine quadrupeds existed during the tertiary and post-tertiary times, of which the geologist has only obtained a few fragments.

A DEAD MASTODON AND ITS DEVOURERS.

Three days afterwards, he examined the same specimen again under similar conditions.

"I am in a different place; but it is the same time. I am by a large lake; and I see those great elephants going round eating grass, and branches of trees. There are large, nice-looking meadows here, just as if man had made them, and cut hay on them every year.

"This is a great place for game. I see many rabbits nibbling grass and playing; and in a little brook I see as many as a hundred ducks up and down for a quarter of a mile.

"I see three elephants feeding in a meadow near where I am. They twist the grass off with their trunks, and then double them up and put it into their mouths.

"Many eagles, and black birds twice as large as crows, are feeding on a dead elephant. There is one large bird with a neck red like a turkey's wattles: it looks about as large as a condor. There are hawks, crows, falcons, and eagles here, and a black bird about half as large as a crow, and crows with long bills. There are about two hundred of them on the elephant. There are rows of birds on his tusks. The air above is alive with birds coming and going. They are screaming and fighting. Eagles are driving

hawks off, and sometimes they claw and kill them. The big bird had a piece of meat; and one of those little black birds got on it, and the bird carried it nearly up to its mouth.

"Those crows do not caw: they squeak. I hear a sound like that of a hen-hawk. Those big birds put their claws right through the little birds, and kill them. Worms are at work on the body too, and some of the birds may be after them.

"One of the birds wiped its bill on the back of an elephant that was feeding. The elephant lifted up its head and sent its trunk over, and made some feathers fly. The elephant made a bellowing noise. The bird has got on to a rock: it seems hurt.

"These elephants have such long tusks, that, when they walk, they plough the ground up with them. I can see places where the grass is torn up in two furrows (1). Four more have come out of the woods. One fellow has a large raw sore on his side, as large as a man's head. They scared the bird off the rock. I see the place where the elephant hit it: it is black.

"I see a falcon trying to fly with a piece of meat larger than itself. It flies up a little, and comes down like a stone, and then up again. Many of the birds light on the elephants to wipe their bills. I see some meat left on one, and little birds are picking it. I suppose some of them think it is a rock."

In answer to questions: —

"The elephants have no mane, but some bristles like pigs. There are a good many hairs on the trunk; but the largest are on the end of the tail.

They have five toes; but they look more like a knot of a tree. They have large flat nails on them."

(1.) Those who have seen the enormous tusks of the large mastodon in the Warren Museum, Boston, will not regard this as improbable.

ANCIENT AMERICAN "CAVE-DWELLERS."

JUNE 13, 1868.

The specimen tried was a part of the tusk of a mastodon. The skeleton, which was found at Cohoes, in the State of New York, is now in the Geological Museum at Albany. Examination made by Mrs. Cridge, who knew nothing regarding the specimen.

"I see nothing but a kind of barren country. There are no signs of cultivation. I see what look like sand-hills on one side. Now I see water; but there is little motion in it. There are reptiles and fish, and some of them are large. I see some men who seem to be naked. The hair is dark and straight, and hangs down over the forehead.

"I see an opening underground, or a cave; and one of them is standing near. He has a skin about his shoulders. His skin and eyes are dark. Here come some children: they have something round their shoulders; but the rest of the body is bare. They came from the inside of the cave. The climate seems cold and moist; but I suppose they can keep warm in there. It seems a good deal like English weather. It is gloomy now.

"They know how to make a fire; and they sometimes cook their food. The children seem to like it

cooked: but the others don't care; indeed, some seem to prefer it raw.

"One of them has a large fish, which he caught with his bare hands.

"Some of them use what looks like salt. I see a fish lying on the fire; and one of them is sprinkling this white powder on it.

"They sit on the farther side of the cave, and let the smoke go out of the front.

"They have large feet and abdomen, and long hair on all the exposed parts of the body, especially on the legs. Their language is very imperfect: it seems a mixture of chuckles and grunts. They are strong, but have no idea of tools, or any thing of that kind. They use a heavy stone sometimes in killing animals, I think.

"Their hands are trained to do a good deal that tools do now. The nails are kept long on the fingers of the men: they are used in catching prey. When that one caught the fish, he held on to it with his nails.

"The perceptive faculties are full and active. The intellect otherwise is dormant: it exists but as a possibility. The man at the entrance of the cave is somewhat superior to the others. He has appreciations and conceptions that they have not. He seems to enjoy looking up at the sky and around him. He put out his hand, and a child sprang on it, and from there on to his shoulder, almost with the agility of a monkey. Then they laugh. Now another one on the other hand and shoulder. He carries them to the water: others follow. Now he goes in, lies down

with his head just out of the water, and spreads out his hands a little way apart. That is the way he catches the fish. The children lie down on the edge of the water, and watch and peer earnestly. He has something that draws the fish to him, when he seizes them.

"Their faces are broad. They have no idea of making clothes: they merely throw a loose skin around the shoulders."

These Indians probably belonged to a time just after the drift period. It is impossible to speak positively. It would take years to unravel the tangled web of humanity even on this continent.

INDIANS OF CAPE COD.

Sherman tried an Indian spear, made of greenstone, and picked up near Harwich, Cape Cod, knowing nothing of its character or whereabouts.

"I am somewhere about this time. I see a man selling pie at some kind of a stand." ("Go farther back in time.") "I am in some very cold place, and I see an animal like a wolverine. It goes along, and stops and sniffs, and shovels snow into its mouth with its paw now and then. It walks slowly.

"I see another one now; but it runs as soon as it sees the first. Their tracks are all over the snow. There are pine-trees; all tall ones.

"The animal has just come to its hole. It is large enough for a man to hide in. All round the entrance their breath has frozen into crystals. The hole goes down a little way, and opens into a roundish place like

a cave. It has dry leaves and grass in it, and is large enough for a man to stand up in. It seems like a natural cave that they had made a hole into. There are two full-grown animals in here, and three nearly full-grown. It is not as dark as one might think. I can see them very plainly. They sleep in here like cats. The one that came in disturbed them. The hole goes straight on to the bottom of the cave, so that the light shines in. It is quite warm (1).

"Well, I declare! I can see an Indian. He came and peeped into the hole while I was in. He is all covered with skins, — furs. He has skinned an animal, and put his arms where its legs were, and his legs where the other legs were; and the neck forms a collar. It is all open in front; but he has another skin inside. He has so much on his feet, no one would know his track. It is round or oval. He is comfortable. The inside skin has its hair inside. His hair is long, and tied under his chin, — to keep his ears warm, I guess. He has nothing on his head. His face looks odd as the wind blows his hair about. He has arrows, and a bow with him, which he carries at his back in a skin bag, fastened with a strap round his shoulder. He has no hair on his face.

"I just saw him shoot a white rabbit. He stepped on a place and scared the rabbit out, and shot it before it ran a rod. He had his bow ready. I think he knew it was there. He is running now as fast as he can run. The snow is quite crispy: it crunches under his feet. His hands are quite smooth. As he runs, he wipes his nose with his fur sleeves.

"I can see where he lives now. In the pine-woods

is a conical hut, with poles stuck up all round, and a fire inside.

"He threw the rabbit against the hut as hard as he could. An old man came out, and he showed him the rabbit. The old man reaches out his hand; but he holds it behind his back. He keeps talking, and rubbing his nose: I should think it would be sore. He has gone inside now. It is terribly smoky; but they have a good fire, and it is light and warm. The door is a piece of skin. He shot the rabbit in the back. He is scorching it over the fire now, and taking the hair off. There are two men here beside the old man and the one that got the rabbit, two women, and one little boy. It must be near this time; for there is an old iron kettle that they must have got of some white people" (2).

(1.) This was probably a wolverine, or glutton, which is found in Massachusetts now, and may at that time have been on the Cape. Gluttons live in crevices of the rocks, or holes in the ground, and produce young once a year, in number from two to four.

(2.) The examination refers, probably, to a time after the landing of the Pilgrims.

ANCIENT INDIANS IN KENTUCKY.

JULY 30, 1869.

Specimen from the Big Bone Lick, Ky., examined by Sherman.

"I see a bear climbing up a tree, and an Indian attacking it with a bow and arrow, — a large black

bear, nearly as large as a cow; but it is not as high (1). The bear is up a tree, and tries to catch the arrows as the Indian throws them (he has some that he throws). How it does growl! It is beginning to turn over. The blood is running down the tree. This struck in the throat; and I can see that it breathes through the hole.

"It has dropped down now; and the Indian is picking the arrows out of it. He is hallooing for other Indians to come. They are coming now. They are dressed in furs all over. They are beginning to drag it along by the feet. Now they sit down on the snow, and are eating it. They want to lighten their load. They eat it raw, as if it were bread and butter. They cut it down the middle of the belly with a stone knife, and dig into it, and eat ravenously. I see the chunks outside of their throats as they swallow them. They don't pretend to chew them."

("How many are there?") "Four. They have eaten almost half of it. They are carrying it again now. It is a great deal lighter. They have an old hut, made of a few sticks, with dirt over them. There are women in there. (Women are born to stay at home anyhow). There are three of them; and they are dressed in furs too: they seem to be bear-skins. They cut up the flesh with their stone knives, and eat it raw. I see no fire. They keep warm with skins. There are two babies. The hut is half full of skins.

"The country is nearly all covered with woods,—some oaks, shag-bark, hickory, and ash."

(1.) The present black bear of America may have been preceded by a much larger bear on this continent, as the present bear of Europe was by the great cave-bear.

ANCIENT INDIANS OF MISSOURI.

The following by Sherman, from a Missouri specimen, shows us the Indian as he was before he knew the pale-face : —

"I am somewhere with a canoe on the water. It is night; the moon is shining; the canoe is empty. A man and woman are in another, away off. These people are Indians. The place is full of grass : it is a marsh, with ditches all through it. The old Indian is talking away : he is pushing, and she sitting. They have spears in the boat. I will draw one. (Draws Fig. 81.) They are like eel-spears, four or five alike. They wind their way round among the grass. They are nice canoes, but burned out. One end is high.

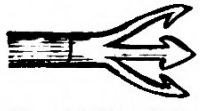


FIG. 81. — Indian fish-spear.

"They have come to a small opening where there are lights. Indians are in boats, spearing fish. They have a good arrangement. In front of the boat is a hole, and in that a torch, hollow at the end, with pitch in, on fire : the light shows the fish, and then they spear them. The fish are not salmon."

("How are they dressed?") "They are dressed in skins, — well dressed for Indians or savages. The fish lie on the bottom, under the light. One man

has two dozen already. There are different kinds, — some eels, and some that look like bass. Sometimes he catches them between the two prongs. He has a splendid one now. When the spear struck it, it tried to run off with the spear. It has large scales and a spiny back. As the moon shines, I can see the feathers in one Indian's hair. The wives paddle the boat round as the men fish. One man has a spear with several prongs, made of bone, and well done: he never misses. The prongs are made of bones, with holes cut through them, and tied together. (Draws Fig. 82.)

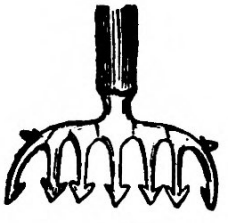


FIG. 82. — Spear with many prongs.

"One has his boat so full, the squaw holds up her feet on the fish. He is going home. The torches last a long time: his is not out yet. His home is not far off: I can see it. There is a light. It is a wigwam, made of sticks and skins. Men and women come out and wade into the water to pull the boat in: they run it away up on the land. I should think two or three families live in the same tent.

"They have a rousing fire, and they are putting the fish on whole. The man who got so many fish has some splendid spears, — all made of bone, except the handles: some are made of the tusks of some animal." (Draws Fig. 83.)

ANCIENT INDIANS IN TENNESSEE.

JUNE, 1869.

Large bone-bead, found near Tennessee River, Tenn., examined by Sherman.

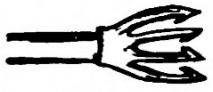


FIG. 83. — Fish-spear made out of a tusk.

"I see a swampy-looking place, covered with high grass, that looks like a prairie. There is an adobe-house in it. It is half a circle. There are some little children that look like monkeys. They are spry, and covered with hair like a bear: the hair is very thick: even the babies have hair on their faces like whiskers almost. They go up to the side of the house, and rub up and down to scratch themselves, as pigs do. There is some clay near there; and I see a little fellow eating it. They have very long toes. They are of a brown complexion, and quite naked.

"The skin of an animal is drying against the wall of the house. The houses are quite low.

"I see one of those knotted clubs that savages use. They seem to be always the same shape.

"There are three women and four babies in this house: one is a boy. They sit on the ground. They have hardly any forehead. Several of them are eating this mud: they have a lot of it inside the house: they take it up by the handful. It is as fine as putty, and looks like it, and is sticky (1).

"A young crocodile comes out of the grass toward the house. One of the women takes a stick and hits

it on the head: it makes a squeaking noise. The rest are hitting it. They have large muscles, I see, when they draw up their arms.

"Here come two men with an animal like a jaguar: it is spotted. The women have nearly killed the crocodile: its head is all battered up. The men have sticks with a sharp point like a pick on one side, and a heavy knot above it. I see marks on the animal made by it.

"One of the men has a bloody leg, and is telling the women how it was done by the animal. One of the women shows the men the crocodile that they have killed. It is green on top, and almost yellow, or a yellowish-green, underneath.

"They are taking the skin off this beast. They use a stone knife. I will draw the shape of it. (Draws Fig. 84.) They put their thumbs through

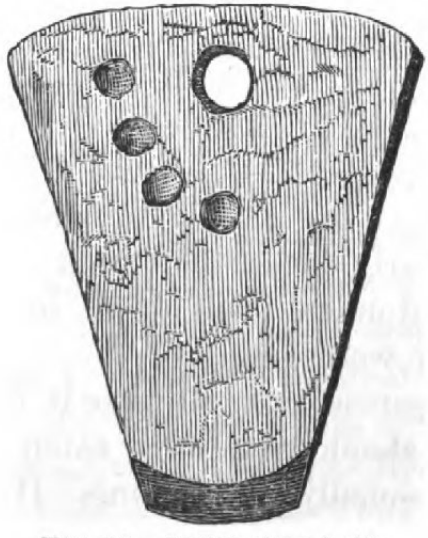


FIG. 84.—Indian stone knife.

the hole, and rest their fingers against the dents on

the side, and cut down the fore-legs, then the middle of the body, then the hind-legs, and tear it off in one piece.

"They have hung that up to dry; and now they lay the body of the beast on the dry skin (the one that was drying against the wall of the house), and are cutting it up with their stone knives, and eating it raw. The little ones have knives, and know how to cut. They seem almost as ravenous as cats. They cut slanting on both sides, and rip it off with their hands too. That is better than mud.

"There are swarms of flies coming now; and they put up the skin before the entrance to keep them out. They are large blue flies.

"These are little people, much smaller than we (2). There are blue places on the arms of the men and women where they have been tattooed. There is not so much hair on their arms: it is mostly on their breasts and backs.

"I see many places where crocodiles have been: they have bent the grass down (3).

"On the outside of the house it is all black with flies trying to get in. Inside they are eating away, though it is nearly dark: they don't seem to mind it. One baby has dumped itself down in that clay puddle where they were eating."

(1.) Some persons may suppose it impossible that human beings should ever have eaten mud; but living tribes occasionally do the same. Humboldt found a tribe of Indians on the Oronoco, who, "when the waters are low, live on fish and turtles; but when the rivers swell, and it becomes difficult to procure that

food, they eat daily a large portion of clay. The travellers found in their huts heaps of it in the form of balls piled up in pyramids three or four feet high. This substance is fine and unctuous, of a yellowish-gray color, containing silica and alumina, with three or four per cent of lime." *

(2.) When in Tennessee, I was told of skeletons dug out of Indian graves, which indicated the existence at one time of a people very much smaller than the Indians of any existing tribes; but I could not learn that any definite measurements had been made by reliable parties.

(3.) The range of the alligator does not extend as far to the north at the present time; but this represents an ancient period, when the climate may have been somewhat warmer than at present. The bead may indeed have been carried from the south, and this may describe a more southern region.

ANCIENT PERUVIANS.

MARCH 11, 1873.

Capt. Potter of Bath, Me., presented me with an article of pottery (Fig. 85), which, on my return to Wellesley, I had Sherman examine, giving him no knowledge of its history. In a letter to me, Mr. Potter says, "The article of pottery came from an Indian grave at Tampa de Mora, Peru. It is a small seaport town on the coast of Peru, about ninety miles south-south-east from Callao, and thirty miles north-east from the Chincha Islands. The country is very mountainous around, and generally dry, barren, and

* Humboldt's Travels, Harpers' edition, p. 244.

sandy, with some trees and vegetation in places. There is a plantation of sugar-cane now at Tampa de Mora, on a level plain close to the sea."

"I am inside of a log-hut; and there is a door that shuts, with pieces of leather for hinges.



FIG. 85. — Peruvian drinking-vessel.

"That is changed; and I am in a place where there are a great many windmills. I can see them for miles. They have long arms, and are for pumping water: they are not going now. The water runs down the hillside into the ocean. There does not seem to be any one attending them. As the breeze comes along, it sets them in motion, one after the other. They are in rows, like trees in an orchard. They must use them for draining that swamp (1).

"I see a shepherd now. He is on stilts: he is as expert at stilt-walking as any one I ever saw. He has a forked stick that he puts behind him to rest on: he leans back, and uses it like a seat.

"I see some people now that look very strange. They are on the beach. Their heads slope up conical-shape, and look very queer: they are bare on top (2). (Draws Fig. 86.) The hair is long and black, and comes over the eyes. Their cheek-bones are high; and they are a very miserable-looking set. They are going along the beach, turning over stones, and eating crabs raw. They tear off the claws, and suck them as they would an egg. They rub their mouths with their long hair; and, away off, one might think them a set of dogs."



FIG. 86. — Ancient Peruvian.

("Have they any clothing?") "They wear a belt with strings hanging down all round, — some longer, and some larger, than others. (Fig. 87.)

"They often fight, but soon stop. If one finds a big crab, he snatches it quickly, for fear some one will come up. They seize the limpets, and suck them down. They are quite smart at getting them off, putting their nails under one side of the shell. The

limpets are larger and prettier than any I ever saw before: they are of a pale green.

"There are seven of these people, and they gabble all the time. They all walk stooping, so that their hands almost touch the ground as they go along. Some have little sticks to turn the stones over with. The legs of the crabs come off easily.



FIG. 87.—Belt worn by ancient Peruvians.

"These people seem to be the old inhabitants of this country. (It is a better class that made the windmills.) There are some little skippers on the sand, that bite their legs, and make them rub them vigorously.

"There are many birds here, and some very near them; but they do not attempt to get them. They do not seem a bit higher than dogs, and they seem dirtier than dogs. A dog would be decent if it could; but they can be, and won't. They are of a dirty-brown color,— darker a good deal than the shepherd I saw.

"In fighting they do not use their hands much, but kick."

("What is the country like?") "It is a level kind of country here. These people do not like the water much.

"I see some of the more civilized people now with bows, shooting birds. Some can shoot them as they fly. The savages are running now, and looking round over their shoulders as they run."

("Describe these civilized people.") "They have very short pants, and stockings that come up to the pants. They look lively, smart, and are well proportioned; and their heads are not like the others. Their chins are pointed. They have a little mustache, but hardly any whiskers. There are five of them."

CATCHING A WHALE.

"Here come two more with bows. They are hallooing about something. I see now what it is. There is a whale near the shore: I can see it spout. The five have turned round, and gone toward where it is. They were in such haste, they dropped their birds, and ran. It is an enormous whale. Some people are already out there after him in a boat. When he brings his tail down, he makes mountain-waves. The ocean is very still here. The whale is not more than a quarter of a mile off. There is a great crowd opposite where it is, and they are very much excited. There is a projecting point near, and a great many are out there. They have a harpoon in it now. It does not try to dive, but is putting out to sea; and they are going after it.

"Oh! just then it leaped clear out of the water. I could see the horizon under it; and then it dived. The boat is going at a great rate. A rope is pulling them along.

"I have just come up to them. A man is pressing on the rope with a piece of leather. The people in the boat seem very cool: I should think they would be more excited; for they are going at great speed. The land looks blue.

"The whale is up; but it is a long way off. They have a great deal of line out.

"It goes three or four times back and forth with its tail, and then blows, quite regular, — something like a steam-engine, but slower. They are drawing in some of the rope now, but very cautiously. The whale bleeds badly: the water is stained. I can see it as the boat goes along. I can barely see land now.

"There is a hollow behind the whale, that reaches to and behind the boat. (I see it faster than it happened.) They are pulling in the rope fast now. I see some of their harpoons: they are very large and heavy, made of iron, and the handle of wood (3).

"They are preparing to put another harpoon into him. A man is standing with it in his hand, very still. He drew his hand back three or four times, and then threw it. The rope was in a ring at the bottom of the boat, and it unwound in the air. The whale does not notice it much. It is not going more than four miles an hour now. Whenever it blows, the blood runs out of the last place like a stream.

"They have thrown another harpoon; but it missed by about a foot. The man is hauling it in now. They

are very near it. The whale's head is flat. It is going round now, as if it were dying. They are pulling the rope in. Some are standing on its back, I declare, while it is alive! The sun is about an hour and a half high.

"Those miserable people seemed to be the original inhabitants; and the others came and took the land."

(1.) It is improbable that the ancient inhabitants of Peru ever used windmills for any such purpose; though they may have used some kind of a water-lifter, worked by wind, for the purpose of irrigation.

(2.) Fig. 86 was made from a sketch by Sherman at the time.* At first sight it seems like a caricature, that never could have had any justification in a living reality: but it is certain that in Mexico and Peru there once lived a people whose heads were as conical as this man's is represented to be; and, even when the skull was not naturally of this shape, it was distorted by pressure, so as to cause it to assume what seems to have been a fashionable shape.

Figs. 88, 89, from "The Types of Mankind," and copied from Del Rio's "Account of Palenque," show that the form as given by the psychometer does not vary from existing cranial types any more than ancient monuments represent as having been the case. That this form was natural is proved by the fact that it is "exhibited even in the *fœtus* among Peruvian mummies." †

* The engraving must not be regarded as an accurate resemblance. Sherman has had so little practice in drawing the human figure, that all his attempts of that kind can only be regarded as rough approximations.

† Types of Mankind, p. 440.

(3.) At the time of the discovery of America, iron is said to have been unknown on the continent. It is not probable that this was iron, though it is possible; since one tribe of Indians was found "near the mouth of the La Plata, who had arrows tipped with this metal, which they are supposed to have obtained from masses of native iron." *



FIG. 88. FIG. 89.

Ancient American heads represented on monuments in Central America.

On the same day, Mrs. Denton tried the same specimen, knowing nothing of its history or of the previous examination.

"I see a boat with persons in it, — a singular-looking boat, near a bank. I do not like the influence of this.

"They are half savages, if not more. The only dress I see is a sort of skirt, that reaches nearly to the knee. The hair is fastened above the head in

* Lubbock's Prehistoric Times, p. 201.

some way, so as to form a kind of ridge, and hangs over, back from that. Such people could not make such a vessel as this, I think, though they have great will-power, and are active and strong, — very active.

"The climate is warmer than this. They seem to have some idea of civilization. They have a dark-reddish tinge.

"I am in one of their dwellings; but I cannot see it clearly enough to describe. It is a coarse affair, — a singular, patched-up place. They seem to sit down in the dirt, outside."

After the examination: —

"It seemed to be near the sea. All did not have their hair in that way; and all did not wear that skirt, but had something wound round themselves, — a kind of blanket."

Had these individuals been as cone-headed as the one drawn by Sherman, this peculiarity would certainly have been noticed. Were they a more advanced tribe, living at the same time, or the descendants of the first at a more recent time?

ANCIENT PERUVIANS SHOOTING FISH.

A few days afterwards, Sherman tried the same specimen again, under similar conditions.

Several scenes were presented, which did not appear to be related to the specimen, and which changed somewhat rapidly.

"I am in a very beautiful place, and see a couple of dark-colored men rowing a boat that has been burned out of a log (1). It is very dry, and looks like a great trough.

"One of them has jumped out, and is wading ashore. He is perfectly naked, and has a bow and arrows. They are not the same people I saw the other night. The bow is stiff; and he has three arrows."

("Describe these men.") "The head is not conical: they have but little forehead. They seem dark-colored. (I do not see well to-night.) Every thing moves very slowly.

"They are on a sluggish river. On the banks are tall canes, or what look like them.

"That fellow moves slowly, and keeps looking. I see now he is after fish. The canes grow to the water's edge. He holds his bow ready as he comes to the edge. He is after large fish. I saw one then: he sees it too. It is something like a cat-fish, and about the size of an average cod.

"Ah! he put an arrow through one; and it turned over. In he goes after it, and pulls it out. That was a straight shot. He took it up, and threw it into the boat: the boat was out in the river. The head of the arrow is made of bone, fixed on with some fibre. It is not perfectly tight, but rattles a little.

"The fish are swimming round where it is shallow. The men are careful not to talk: they make no noise, but just motion. Those in the boat beckon to the one on shore when they see a fish.

"He has another now, much larger than the first. The arrow seems to make them numb. They were both struck in the same place, — a little on one side of the back-bone; the right side, looking toward the tail (2).

"I do see a big one now. It keeps opening its mouth; and, every time it does that, it sticks its nose out of the water. He missed that. He is after his arrow, taking up dead canes and stuff to find it. It is so deep, that he lays his face down on the water as he reaches to get it. Now he sticks his head under. He has got it, all covered with mud. The arrows are very nice: they spend a good deal of time on them. The bow is very hard to bend.

"He looks very dry when he comes out. He must be oily like a duck."

("See where they go, and what they do with the fish.")

"Gracious! The fellow in the boat is scared. An animal like a crocodile came up, only about four feet off. He struck at it with a paddle, but missed it. He is going from that place. The other is hallooing, or whining: it sounds more like that."

AN ANCIENT PERUVIAN DANCE.

"There is some high land farther off; and I see more of these people sitting there, and some going through a kind of dance.

"They have a band here, or what is a band to them. They have something like a keg, longer than a drum, with a skin stretched over one end. The skin is hairy on the other side. A man is pounding on it with round-ended sticks. He walks round with it under his arm; but they do not step to it, and do not pay much attention to it.

"These people have conical heads. Some of them pull their hair up over the top, and tie it with some-

thing like bark, colored. It is blue; and the hair hangs down over that all round, and looks almost like a soldier's cap.

"I see a nice-looking person in this gang: I do not know whether a man or woman. The hair stands up all round like the hair of a brush; quite long. Pleasant-looking face.

"It must be a chief. They all seem to pay attention to him. They are all dressed a little. This one has a rude kind of coat, made of a spotted skin of some animal of the cat kind. It comes down to the knee. He has a petticoat worked in with birds' feathers of different colors (3). It looks pretty away off, but rather coarse near.

"They are going through all sorts of performances. They turn, and bow to each other, and strike their heads together with quite a sound, and then turn and bump again with the next one, and so on; and keep time in doing it. It is all done quite solemnly too; the man in the middle walking round, and hammering his drum.

"A monkey up in a tree is watching their motions, and is as excited as a cat watching a spool.

"They leap high, and come down as soft as a cat. They sweat a good deal: I can see it on their necks. It looks almost white on their dark bodies, as you see it on a horse sometimes. Some have very scanty beards: that seems to be the way they grow. Their skulls must be thick, to bump that way.

"They are sitting in a circle now. To clean themselves, they rub with a handful of grass. I cannot tell the difference between men and women by their dress.

"Now they are fooling. Some are pretending to eat grass sideways, with their faces on the ground; and some are rolling over and over toward the water.

"Now I see the fellows that I left up the river in their boat: they belong to another tribe, I think.

"I see the chief drinking out of *this very thing*. They never touch the mouth with it, but pour it in (4). I see many other vessels; some much prettier than this. One has a fish on one side of it, such as the men caught. Some of the vessels are painted. They all seem to be drinking-vessels; but some hold a sweet kind of juice. I see only one of the same shape as this.

"They are drinking something now that is intoxicating, I think. They act like it."

(1.) The Krumen of Western Africa, and the Warans of Guiana, and other uncivilized peoples, make use of fire to hollow out their canoes, finishing them afterward with their rude tools. In this case, fire alone seems to have been employed.

(2.) The Andaman-Islanders shoot fish in the same way at the present time. The Ahts of Vancouver's Island do the same thing; and their arrow-points are also made of bone.*

(3.) The Spanish conquerors of Peru noticed these petticoats of birds' feathers, which are still worn by various South-American tribes.

(4.) It was probably on account of this peculiar method of drinking, which is still practised by some semi-barbarous tribes, that many of the Peruvian

* Wood's Uncivilized Races.

drinking-vessels were made with a double throat, uniting in a single neck, from which the water was poured. In this way, while the water was poured out from the one, the air rushed down the other to supply its place, and gurgling was prevented.

ANCIENT PERUVIANS MAKING SAGO.

He made an examination of the same specimen three days later.

"I seem to be in a kind of cane-brake. I see more distinctly now. There are people here with something in a trough. The trough is made of large pieces of cane fastened together so that it does not leak. Each piece of cane has a rounded surface. The trough stands on a bench. There is a thick, white liquid in it, and what look like lumps of flour. It is some kind of a vegetable. They cut it out of a tree that has a very large pith like an elder. They pour off the water now, and put in clean. After they put the water in, they tilt it up and down: it rests on a bar, and is easily moved.

"I like the taste of it. It has a nice, fresh, sweet taste, — not sugary. It is something like cheese-curd when first made, and is in little lumps, something like that. They put in their fingers now and then, and take out pieces, and eat (1).

"These men's heads are not peaked like those I saw the other night (2). They wear a breech-cloth; but it is made of coarse stuff, — like a date-bag. They are quite dark-complexioned, like mulattoes. They are very silent.

"When it is done, and dried on bark, they put it

in bags made of the same kind of stuff as the breech-cloth.

" After you have kept this in your mouth a while, it is glutinous, something like gum. It does not take long to dry, the sun is so hot.

" The troughs look as if they might be used for canoes. I see old ones all broken to pieces."

After the examination: —

" I saw one split a tree in two. He used a large, round stick of wood to get the pith out. I heard it squeak as he shoved it. He drove the stick with a kind of mallet."

(1.) This was probably sago, the product of several species of palms, some of which are found in Brazil and Peru.

Forrest describes the process of sago-manufacture as carried on in the Molucca Islands, which appears to be very similar to the process seen by Sherman: " The tree, being felled, is cut into lengths of five or six feet. A part of the hard wood is then sliced off; and the workman, coming to the pith, cuts across the longitudinal fibres and the pith together, leaving a part at each end uncut; so that, when it is excavated, there remains a trough, into which the pulp is again put, mixed with water, and beaten with a piece of wood. Then the fibres, separated from the pulp, float at top, and the flour subsides. After being cleared in this manner by several waters, the pulp is put into cylindrical baskets made of the leaves of the tree." According to another process, after being taken out, " it is laid upon wicker-frames to dry."

(2.) These men appear to have been similar to

those seen by Mrs. Denton, and to those described by Sherman as fishing with bow and arrows.

CROCODILES OF ANCIENT PERU.

Examination continued: —

"I see a crocodile, or alligator. As he came up with his mouth open, the lower jaw full of water, polliwigs were swimming round in his mouth. The teeth are not sharp, but large: some of them are three inches above the gum. I think he must be very old. The head is rough, with little bunches all over it. I think the skull must be rough too. He seems to fear nothing. But a fly on his eye makes him wink; though he does that slowly.

"There are a great many crocodiles round here. It is a low, marshy place. They open their mouths as they go along. I saw a bull-frog jump into one, and jump out again. I suppose he mistook it for land.

"What a number of animals live on a crocodile! I should think a hundred, mostly leeches and flies. There is a kind of water-moss on the back of that old one. The leeches are crawling all over to find a good place to suck.

"This is a beautiful place, — a fine place for game. I see ducks on a pond. There are hundreds of large wading-birds like cranes. They look like posts at a distance, and might deceive a person."

("What does the country round there look like?")

"It is a rolling country; but the elevations are so gradual, that I think a railroad over it would not need to make any cuts (1). I see trees with a great many vines about them like ropes.

"Every thing has its enemy. I see the crocodiles sliding up to the birds to seize them. Some of the birds have crests. One of the crocodiles came to a bank, and fell, and rolled over. It is quite white and clean on the under-side. How rough and uneven the mouth is! The jaws are all hills and hollows. When the cranes catch a frog, they keep gobbling till they get it down. It is nearly night."



FIG. 90. — South-American bittern.

ANCIENT PERUVIAN CAVE-DWELLERS.

Changed the position of the specimen: —

"I am in an altogether different place. It is rocky, mountainous. I see those cone-headed people again. A number of them are going up the side of a steep mountain: they have sticks and other things to help them up. They are lugging a large spotted snake. They must have been on the hunt. In one place the snake is cut nearly in two.

"Some of them carry sticks with a stone stuck in them for an axe, and bound with raw hide. All have some kind of a weapon. They use them for

climbing now. The snake seems to have been battered by those axes. The tail wiggles yet: it is twisted round the man's arm that carries it.

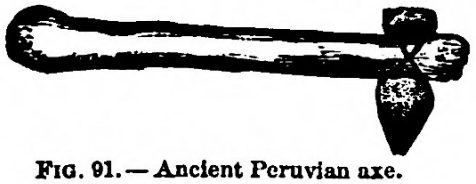


FIG. 91. — Ancient Peruvian axe.

"There goes one man down. I should think he went fifty feet, tumbling over and over. It is hard climbing. They are waiting for him. He does not care: he runs up. They pull themselves up with their hatchets, hooking them on trees and bushes. They use the snake as a rope part of the time, pulling themselves up by it when those near the head rest.

"These men are tattooed all over. Some have perfect circles on them: they look pretty." ("What color?") "They look darker than the rest of the skin, — black. Some of them have a little beard.

"Their dress seems more for ornament than use, — nothing but feathers, pieces of skins of spotted animals, and such like. They have a great resemblance to each other.

"One of them killed a squirrel with stones fastened to a string. He swung them round his head, and then threw them, so that the string twisted round the animal, and killed it (2). I see no bows and arrows among them. Some have small spears tied in their hair.

"Now I see the place where they stop, — a kind of cave, that seems partly natural, and partly artificial. The front is built up with stones and timber, and

daubed with clay. I see dogs standing at the entrance, quite shaggy. It is a queer place inside; quite large; and there are as many as fifty people in it, many of them sitting around a fire. It is twenty feet high in places, and goes back more than a hundred feet. There is a small monkey over the fire, roasting, toasting, sizzling, held by two sticks stuck in the ground, that go through it. They don't starve here. They are all out now to see the men come with the snake. They make a great noise of welcome.

"I see enough jars to cover this floor. Some are vases two feet high; and some look like small tubs. Many of them have handles like skillets. There is some kind of fruit in some of them; and something intoxicating in others, I think.

"The pottery does look nice. There are faces and heads on some; and, on one, men running. Some are quite artistic. Some are black, and others painted of different colors.

"There are lots of children, and all naked; though it is cold up here. I see women. They have skinned the snake, and are cutting it up (it looks nice after the skin is off), and putting it in jars. It is as thick as my leg in places. They are clean. They get water from a little brook that runs down near.

"The men order the women round."

I inquired if he could tell what was the condition of marriage among them. He said he could not; but he saw two men ordering one woman about.

"The young ones are very thick here. They have a piece of the snake, and are fighting over it, and running round, and rolling about.

"The entrance to the cave is low: the men are obliged to stoop to go in.



FIG. 92.—Ancient Peruvian pottery.

"They have leaves for beds, and skins for blankets. They sleep with the fur side next to them. They have a great many skins, some that look like tigers'."

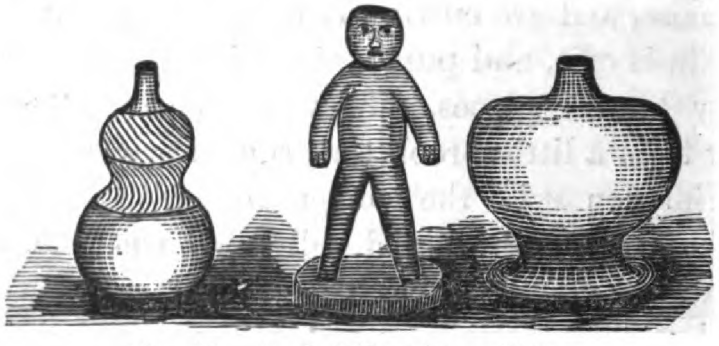


FIG. 93.—Ancient Peruvian pottery.

(1.) It appears somewhat singular that he did not

observe the mountain-ranges; but the vision of the psychometer is, at times, as much circumscribed as it is at others enlarged.

(2.) Such a weapon, called a *bolas*, is now in use among the natives of Patagonia. Capt. King thus describes its use: —

"They do not try to strike objects with these balls, but endeavor to throw them, so that the thong shall hit a prominent part; and then, of course, the balls swing round in different directions; and the thongs become so 'laid up' (or twisted), that struggling only makes the captive more secure." *

ANCIENT PERU.

A short time afterward, I scraped a little dust from the inside of this vessel so that Mrs. Denton might not recognize it, and gave it to her for examination.

"I seem to be on the land, looking off on the sea. At a distance is an island or a vessel: I cannot tell which. There is a city somewhere near here.

"The climate seems to be temperate; but it is more the result of height than distance from the equator. This seems to be a plateau, and would be warm if the land were lower (1).

"I am farther back from the ocean than I was at first, and higher. The plateau is quite extensive. The climate seems to be very fine here.

"I do not know what this means. I notice a purplish tinge all round. I judge it is either a volcanic

* Quoted in Wood's Uncivilized Races, p. 530.

district, or one troubled with earthquakes (2). There are earthquakes occasionally. I see no volcanoes.

"I think it is nearer the equator than this country, and on the Western continent.

"It is a delightful place; but I should be afraid to live there, on account of its instability. (I should like to know the cause.) The air is very clear and pure and electrical. I do not know what the cause of that instability is." Instantly: "Yes, I do. This place is connected with a volcanic district. There are no volcanoes here; but it is connected with a distant volcanic district (3). There is a direct subterranean connection. The lava rises higher, that is, comes nearer the surface, for a great distance from and around here; and this is connected with where it rises at times to the surface. I think any volcanic eruption there would disturb this whole region. The crust seems thinner here."

After this examination: "I think I stood with my back to the east or the north-east when I looked off on the ocean."

(1.) Being within thirteen degrees of the equator, the plateau in this portion of Peru would be subject to intense heat, were it not for its height. The table-land of Cuzco, which lies east of Tampa de Mora, has a height of from eight to eleven thousand feet, and a length of about a hundred and fifty miles. In consequence of its height, it has a climate that allows the fruits and grains of Europe to grow to the greatest perfection.

(2.) There is no place on the globe of which this can be said with greater truth than of the neighbor-

hood from which this specimen was brought. So numerous are earthquakes in the vicinity of Lima, that Humboldt says, "Faint oscillations of the soil are regarded with scarcely more attention than hail-storms in the temperate zone." *

"Along the whole coast of Peru the atmosphere is almost uniformly in a state of repose. . . . But the mildness of the elements above ground is frightfully counterbalanced by their subterranean fury. Lima is frequently visited by earthquakes; and several times the city has been reduced to a mass of ruins. At an average, forty-five shocks may be counted on in the year." †

(3.). There are no volcanoes in that neighborhood; but, between two hundred and three hundred and fifty miles south-east, there is a group of fourteen volcanoes, many of which have had eruptions within the historical period.

EARTHQUAKE IN PERU.

The examination was continued a few days subsequently, the specimen being still unknown.

"I am down near to a river; and, on an eminence near, there is quite a large town. I see several singular-looking houses, — high for the width, rounded at one end, and pointed at the other with three points, or rather small rounded tops. Others have a high front, are quite long, and the back nearly touches the ground. Quite a large space is covered with them.

"I now see a great many people in great commo-

* Cosmos, p. 217. † E. C. Otte, in Cosmos, p. 216.

tion. I cannot tell what they are doing; but they are active. I can see animals among them of some kind. They are outside of the town.

"I seem to be in a different place altogether, — a place quite hilly, a multitude of little hills or mounds very close together.

"It seems as if the whole population of the town had turned out, and left the town entirely deserted. Where they are, there are no trees nor buildings, — bare, open ground.

"I think I know now. I heard a rumbling underground: it is almost a bellowing noise; and the people are scared away from the town.

"There is a terrible commotion. I think the place where I saw the small mounds was made by earthquake action. There is a terrible agitation in that volcanic region I saw the other day: it is in a perfect turmoil. I can see the lava boiling and heaving up at this end of that district. There is room for it to boil up. There seems to be a great cavity for an immense distance, which seems to connect this with the volcanic district.

"I do not think the lava is going out at the other end, though something does. I think I can go there and see what it is.

"I am not to it, but nearer than I was; and I can hear it puff, puff. There seem to be very severe explosions. I do not think that lava is running out; but there are bombs and rocks shot out with great violence.

"That force confined would make an earthquake. While the explosions are going on here, the other end

is in great commotion. I cannot see between the two. It seems as if I stood in a great cavity. At one end there is an opening down to a great fire, and the lava keeps boiling up; and at the other end there is an opening down to the fire, and up to the surface, from which these explosions take place. Solid rock forms an arch overhead, and a floor below, from the one to the other, — in places almost glassy-smooth, and in other places uneven.

"There is a singular sucking sensation from that volcano: I feel it alternate with the puffs."

Humboldt was of the opinion that a cavity very similar to this described by Mrs. Denton exists to the north of the region that she examined. He "considers it very probable that the greater part of the high region of Quito, as well as of the neighboring mountains, is formed of an immense volcanic dome, which, extending from north to south, embraces a space of more than six hundred square miles." *

A volcanic eruption, by driving the matter out of a crater, must cause a comparative vacuum in this great interior cavern; and hence, probably, the "sucking sensation" to which Mrs. Denton refers.

All that we have yet done by psychometry in archæology seems to be not much more than to give us glimpses of the immense region that is yet to be explored. I intend, at some future time, to take up some one European or Asiatic race, and trace it, if possible, from its origin, through its migrations; mark its grand changes in customs, language, art, and reli-

* Johnston's Physical Atlas, p. 42.

gion; its amalgamation with and consequent modification by other races. This cannot fail to shed much light upon the present condition of the human family. History does not furnish us with facts sufficient to solve the problem which humanity everywhere presents; and, even with the aid of archæology, we may have to wait for thousands of years before we determine questions respecting which the thinking world stands almost breathless to hear to-day.

As the spirit originally in the acorn urges it on, through blustering winter and balmy summer, to its eventuation in the sapling, the tree, the forest-monarch; so the human spirit, in the first rude representatives of the race, has urged them on, through ages vast, to the comparative elevation of the present, and is everywhere to-day expressing its dissatisfaction at the highest attainments of this age, that it may lead them to lordlier heights in the ages to come.

What can be more interesting than to watch the growth of humanity from its birth in the tertiary times to its present comparative maturity; to see it crawl and creep, stagger and advance, fight and retreat, hear its first rude attempts at articulate speech, its first appreciation of its intellectual superiority over the surrounding brutes, and its demonstration of that superiority by the formation of clubs, spears, bows and arrows; to watch it pass from the wooden to the stone age, its form becoming more erect, its language more melodious, its customs less brutal, and its moral and religious sentiments more controlling, till it assumes the truly human expression, and gives

promise of an actual in the future that will be equal to the highest spiritual ideal of the present? By psychometry, and perhaps by psychometry alone, can this be fully done, and man read his glorious future in the light of his progressive past.

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VOL. III.

BOSTON:
PUBLISHED BY WILLIAM DENTON.
1874.

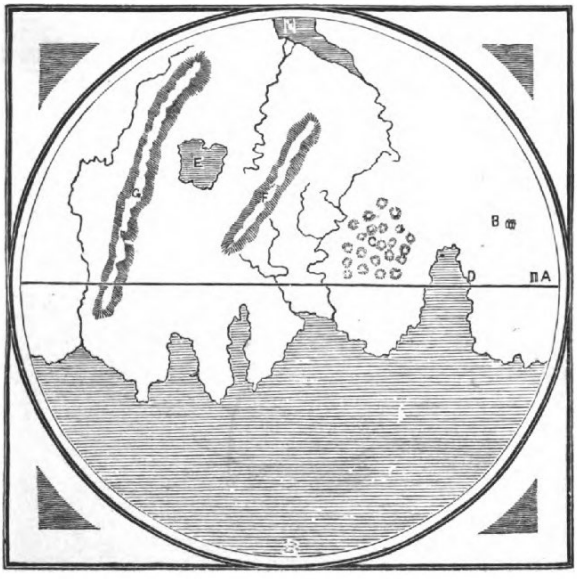
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A. — Astronomical convention.
B. — Houses and city, seen March 19, 1870.
C. — Sugar-loaf hills, seen March 23, 1870.
D. — People seen recreating March 5, 1870.
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THE SOUL OF THINGS.

CHAPTER I.

GEOLOGICAL EXAMINATIONS.

GEOLOGICAL investigations can hardly be said to have begun before a hundred and fifty years ago; yet what multitudes of organic beings have been called up from their rocky sepulchres, and made to tell their portion of the story of the earth! The grand order of the development of our planet, from its fiery chaos to its man-crowned beauty, has been revealed; and every day adds to the perfection of the revelation. But all that the geologist has had to draw his lessons from have been fragments, and sometimes very small fragments; and in no case has he been able to observe a single perfect animal or plant of all the host that he has described. The resurrection-trumpet has been sounded; but only the old skeletons have come up, or fragments of skeletons, — a bone, a tooth, a claw, or a scale; and from these he has had to guess, too frequently, what others have supposed he knew; and the guess of yesterday, and the fabric reared upon it, may at any time be thrown down by the fact of to-

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morrow. We need only to look at the various restorations of extinct animals contained in our geological works, and mark their great differences, to see how difficult it is to clothe an animal with flesh, even when the whole skeleton has been obtained: how much more difficult when we have only a fragment of the skeleton!

But, however deficient the geologic record may be, the psychometric record is absolutely perfect. From a fragment of a mastodon less than a pin's head in size, the original animal may be seen with perfect form and color and surroundings; and the psychometer, if an artist, may draw it as perfectly as the living animals around him. The hosts that have died, and "left no sign" in the rock that the geologist can observe, the psychometer finds alive and active; and he can at will pass along the grand life-processions, and mark every progressive step, from the gelatinous dot in the primal ocean to the Greek philosopher in his study.

Geological books are to be written in which all the animals and plants figured will be perfect in form and color, and their true position in the scale of life be accurately assigned; picture-galleries are to be made in which they will be represented, and a walk through them will teach a person more of paleontology than a year's hard study at the present time.

What is seen by one psychometer will be checked by the independent sight of others, and the new discoveries that geologists are constantly making, as well as by the symmetry and harmony that exist among all living beings; and all the facts of the past of our

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planet that we may consider worth appropriating will become the property of the present and the future.

MASSACHUSETTS IN THE LONG-AGO.

To the geologist who is not afraid of a fact because it is new or strange, there can be few subjects of greater interest than the pictures of the primitive history of our planet which psychometers have drawn. In the fall of 1866, while waiting at Worcester Station for the train, I asked Sherman, then ten years of age, to see what that part of Massachusetts was like long ago.

"I see tents, with Indians in them. There was a small stream coming down that way" (pointing toward the town: there is one now; but he could not see it for the houses) "at that time. The Indians talk away; but I cannot tell what they say. They use bows and arrows. They have feathers in their hair. There are many hawks around. It is a hot day.

"One Indian is pointing his arrow at a hawk. Yes; several of them now. Two have missed, and one hit and killed it. The one that hit it is running with it. He has put it on the fire. There are some little coals, and he is blowing them. He has got it into a blaze now: it is inside a tent. It is not a hawk, I see. It has a straight and very short bill. The bird is as large as a full-grown chicken. It is done now; and all those in the tent are sitting down, and eating it. They tear it with their fingers. Another one is killed now. They look very small up in the air. The arrow stuck into him, and they have

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got it out. They are doing the other the same way. They take out some of the feathers, and stick them in their hair. They are quite pretty."

("Go back a little, and see earlier men.") "Oh! I went too far. The land is heaving up like the waves of the ocean, but away up as high as a mountain, and then down, away down, in five or six minutes, — miles down, and then miles up again. I see great cracks, larger than a river, away down to the lava; and in half a second the lava comes rushing up. The rocks were solid then; and they bend and snap and crack — oh, awful! A person could not see half a mile off, the land rose up so; then it sank down, and he could see miles away (1). The smoke comes up out of those cracks in great rolls, with a noise louder than thunder. I see no living thing. Nothing could live; nothing could breathe. The air is full of gas; all poison. It comes up with the smoke. This lasted for some weeks; then it was all quiet; but after that it belched out again. The smoke came out till it darkened all the sky. The sun could not shine through it. It clears off in spots sometimes, and the sun shines there, but nowhere else.

"The lava poured out of those cracks has bubbles on it; and, when it cools, there are holes, from the size of a pin's head to the size of the top of a bushel-basket. I see big bubbles that I could walk on: they sink; and the gas and steam run under, and come up in bubbles somewhere else. When it cools, they break, and that leaves the rock full of holes. I see a bubble now, nearly as large as this station-house.

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There is a crack under it full of smoke. This does not break: it is thick; but, long after, it fills up, and is like the rest of the earth.

"Sometimes it scares me when I get into these places: it seems as if I could never get back again."

(1.) When the crust of the earth was first formed, and while it was still, to some extent, plastic, such phenomena as he describes must have taken place frequently; since, thick as the crust now is, it is heaved and rent by the imprisoned force which was probably much greater when the earth was in a more highly heated condition.

The original fiery fluid condition of our planet is seen by all psychometers that I have tried. Geological facts innumerable have established it beyond all reasonable doubt.

AN EPITOME OF THE WORLD'S GEOLOGICAL HISTORY.

In November of 1867 he tried a slab of limestone from Waynesville, O., and said, —

"I can see men with it, if I wish." I said, "Go back as far as you can."

"Oh! I see the world all lava, and it is all waves. There are little pieces of crust floating on top, that have cooled. I see different colors of metals, — one green, and another that looks like water. It looks like molasses boiling. It rises up like a large blister, and then puffs out, when it bursts, and sends up some into the air.

"One of those bubbles rose up like a tall moun-

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tain, — the tallest I ever saw: it burst at the top; and clouds of what looked like steam rose out of it, and then it sank down.

"The lava is quite hard now, and streams of soft lava pour over it.

"Now I see ponds of water run on top of the lava, like drops of water on a hot stove. They keep running, and growing smaller and smaller, till they go to nothing. The water runs in large lakes. It stays a long time in some places; but all evaporates at last. Water comes up in these bubbles, and pours over. There is some kind of stuff that floats on top of the water, like oil. It is a kind of metal, I guess. It runs down like water on quicksilver (1).

"The sky is all red. The sun looks a great deal bigger than it does now: it looks three times as large (2).

"It is about all I can do to breathe. If I were there in the body, I could not breathe at all. It seems as if it would stop up my nose and mouth. I feel as I should if somebody put a pillow on my face, and sat on it." ("Go farther back.") "The world is hardly rough at all now, and no gases, no water, no bubbles, nor any thing. It is all calm. It is a great sea of lava, as calm as the ocean ever was. No crust, nor any thing. There is no day nor night to the world. I cannot see the sun, the lava is so bright. It is just as bright as the sun. It would roast a potato twenty miles off." ("Can you go back farther than that?")

"I went back, perhaps, a million years; but it looks just the same. By putting it up to my hair, I can

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see the present." ("Come gradually to the present.") It seems as if the earth was slipping under my feet, and the sky rolling over my head. I can go back and forward in time by pushing the specimen up and down. I can see the men of the present; then early men; then bears and elephants, and such things; then snakes, crocodiles, and other reptiles; then birds; then animals like the trilobites and such things, and shells; then little bits of insects; and then nothing at all but lava. The animals get less and less, till there is nothing." ("Come gradually forward.")

"Now those little bits of insects that pat the dirt (3), now trilobites, now insects, now very low shrubs, now trees, now reptiles and birds and snakes and such things, now the very early men, and then as it is now."

(1.) This may have been potassium, unable to burn in consequence of the lack of oxygen in the enveloping atmosphere.

(2.) One can hardly suppose the sun to have been visible from the earth at that time; but the water of the globe may have been steam, which, before it condenses into vapor, is as transparent as air. The great apparent size of the sun may have been due to the medium through which it was seen, the atmosphere at that time being very much larger than it is now; though, if the sun is a cooling globe, it must have been somewhat larger then.

(3.) These, which are referred to in another examination, appear to have been small crustaceans, and one of the earliest animals that lived occasionally on the land.

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THE WORLD BEFORE LIFE.

In April, 1868, trying a specimen of quartz from Switzerland, he said, —

"I see the earth all lava, and the vapors rising. The air is very strong, poisonous. The vapors curl up like smoke of different colors. There is a green vapor that is very choking: it rises from light green metal, that floats in currents on top of the lava. The lava is almost white-hot, and currents of green and blue flow among it. Mountains of lava sweep along like waves in the ocean.

"Now I see a little bit of a black crust on top."

(Moving the specimen up his forehead, he said, "Every move I make is about a million years ahead.) You could break it through with your foot. Now it is thicker. The volcanoes come up as bubbles on the water, near falls, and cover the earth as small-pox does a man's body. I see hills rise and sink every few minutes. They rise (lava pours out), and then sink as level as before.

"Plenty of smoke now, and showers of red-hot stones.

"Now the crust is thicker, and not so many volcanoes. The world looks curious, — great bubbles, with thin crusts that would just bear you. They are black, with some white streaks in them. I broke through some (it seems as if I had my weight). The earth is terribly hot yet, and the sun is hot too.

"The earth is black now everywhere, all rock. Part of it is broken up, and marked with rings where the volcanoes have been.

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"I see some water now, — an ocean: there is a volcano in it. The water is hot: it boils like a pot on the fire, and steam is everywhere. I see a mud volcano. It throws up great *splathers* of mud into the air: it is real hot. It is two or three miles across the crater. Once in a while I hear an awful thundering, and then the mud is sent out in great masses. There is such a racket all over the earth, you cannot hear yourself speak.

"The earth is cracking now; and earthquakes shake every thing. I see down to the lava: it comes bubbling up once in a while. I threw a stick down on the lava; but it did not blaze up for a good while." ("Where did you get the stick?") "I imagined I had one; that was all. The clouds form into many shapes of things.

"I see a volcano now, pouring out nothing but clear hot water like a river. It makes hardly any noise. It takes it as easy as can be. It runs into a kind of basin, and forms a pond. The ground is so hot, that a man could not stand on it ten minutes without being scorched to a blister.

"Those patting animals are the first things I see on the land; and I see nothing earlier in the water. They lived in the water too."

These descriptions are suggestive, to say the least. Whence come such vivid pictures as these? That the boy saw them is beyond all question; for, although I have never seen any thing similar, the persons who have, when trying specimens for me, number more than a dozen, some of whom knew nothing about the matter till they came up before them. Whence

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such a scene as the hot water rolling in lakes over the heated surface of the earth till it was evaporated; the rocks so soft, that they rose in bubbles; and, the steam enclosed blowing off, they sank again; the mud geyser, and the volcano pouring out water like a river? All these seem natural enough when we hear them; but what suggested them to the mind of the boy, or, rather, presented them to his internal eye?

A few weeks ago, Sherman made another examination of an early period of the world's history.

"I see the earth red-hot. There are black spots on it, as there are on the sun. It is very still. There is a great deal of black smoke rising from cracks in these black spots." ("How large are they?") "Miles in extent.

"It looks as if all the moisture was in the air. The water comes down at times in streams, sheets, and then flows about like water on a hot stove (1). The surface of these places is quite black and smooth. There are slight elevations and depressions; but they are rounded and smooth. The water does not evaporate as fast as it would if it were not as hot. I hear reports like a cannon going off. I do not know what causes them.

"There is a great deal of electricity. Every second or two the lightning flashes, and I hear the reports, — no long, rumbling sound, but as if they were very near. The report follows the flash at once (2). When I look up, it is dark, there is such a cloud; and, when I look down, it is light. All over the black spots are holes; and out of each of them is a steady blaze, almost white, three or four feet high, coming up all the time.

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"The bright part of the earth looks white, and as if one could see into it. The surface is as smooth as glass. The rain falls on that, and turns it black as soon as it falls; but it soon gets as hot as ever. There is some noise and agitation underneath, where it is black.

"I see on one of those black spots a little sea, that remains there. It is not even boiling; but steam rises from it all the time."

("Is the water clear?") "Yes; quite clear." ("Taste it.") "It is fresh water, but warm. It seems like good water.

"I see another small lake near there; and it looks as if petroleum was on it, and burning. I see nothing but a bluish-yellow flame, that looks like the flame of alcohol and salt (3).

"I can see a great deal of mica in these islands. One mass is two feet thick, ten feet wide, and fifty feet long. It has been lifted up, so as to show its edge."

(1.) The mass of water contained in the ocean is estimated at $\frac{1}{1800}$ of that of the earth. It has also been estimated, that if the surface of the earth were level, and the water of the globe equally distributed over it, it would have a depth of no less than two miles. If we add to the water of the ocean what is now a component part of rocks, and that which is contained in rivers and underground-crevices, we have an immense body to be held over the earth in vapor, and that would drop as soon as conditions would allow, which would be while portions of the globe were still intensely heated.

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(2.) The evaporation of water produces electricity; and, when evaporation was proceeding as rapidly as at this period, electricity must have been generated very abundantly.

(3.) The yellow color was probably due to sodium.

THE DAWN OF LIFE.

For long ages the planet must have been a grand chemical laboratory, minerals forming, dissolving, and re-forming, as changing conditions necessitated. For ages more it must have been a rocky desert, on whose heated bed fire and water struggled for the mastery. Life at length appears, probably in forms too small for the eye to see; and the first the psychometer observes are merely what are conspicuous enough to arrest his attention.

The specimen examined was a small fragment of a supposed fossil (*Eozoon Canadensis*) from the Laurentian rocks of Canada.

Nov. 5, 1867.

"I am near the ocean; and there is a volcano in the water, a long way off, throwing up rock. I can see the water steam when the lava comes down; I can see those things that pat down the dirt (1). The climate is very hot. I see no other insects than those that pat the dirt. There are hot springs on a little hill boiling up.

"Every time the volcano bursts out, the air almost knocks me down. It is like a thousand cannons going off at once. There is very little to see, — no trees, nor any thing. As I go along the shore, I can

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see seaweed: it is red and short, about half as long as my little finger. In some places the rock is reddish. Once in a while I can hear a stone drop right near me from the volcano. The land is nearly all rock, and the rock is nearly all full of little holes (2). In some places there is rich soil, and a kind of plant growing in it that has little branches like pine-needles. It is about an inch high" (3).

(1.) Referred to previously.

(2.) The rock, from his description, appears to have been lava.

(3.) If this is really a description of the earth at the time when the Laurentian rocks were formed, there are many blank pages in the earth's geological history, or at least many pages that we have as yet had no means of reading. The oldest land-plants at present believed to have existed are found in the primordial rocks of Sweden; but the Laurentian rocks are probably much older than those; and even there we cannot be at the beginning, even, of land-vegetation, though probably near to it. Yet, previous to that, life must have existed in the water for a long period.

LIFE IN CAMBRIAN TIMES.

The Cambrian rocks, so called because well developed in Wales, ancient Cambria, represent to the geologist the next step in the world's history.

Small fragment of *Oldhamia radiata*, from Ormes Head, Ireland. Specimen unseen, and nothing known by the psychometer regarding it. Examined by Mrs. Denton.

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"I see what looks like a point of low land stretching into the water. I seem to be beside an immense mountain-range. It seems as if the land had dropped down, and left a precipice of enormous height (1). There seems to be nothing here but water and rocks, — naked rocks, holding water in large basins. I see no sediment nor soil anywhere. I see no algæ in the water, and no lichens on the rocks. All is bare and desolate, as if worn by water. This seems to be near a large body of water which I sense behind me."

("Is there life anywhere?") "I see none here. This rocky tract is very extensive. It seems somewhat narrow in front, but extends right and left of me a long way. Massive rocks lie around, that seem to have been broken by some convulsion. They are angular; and water is all in among them. The water is not as salt as the ocean; but it is not fresh. To the north-east that high range sweeps down low, and there seems to be a river flowing in.

"There is something growing here that clings tightly to the rock, as if it had nothing else to live on: I think it is where the water washes over the rocks. (That river widens out greatly at its mouth.) I see some shells here in shallow water that are curved like snails. There are two or three kinds here, — three kinds. One is flattish, and a little oval. It has a whorl just at the small end. The first kind has little points all over it, making it rough, though the shell is thin: all of them, indeed, seem thin and fragile (2). The largest that I see are about a quarter of an inch broad, and a little longer.

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I see another gasteropod, with ridges across. Now I see a bivalve: it is also small, but ridgy. I am at the margin of the sea, — at the mouth of that river.

"Now I see a shell that has an inside shelf. It is a bivalve; but the shelf is softer than the outside shell, though stiffish. One kind has clusters of marks, or ridges, upon it, in two ways, from near the edge of the shell, three of them on each valve, but the middle one larger than the others.

"I cannot tell whether the animal that I see now belongs in the water, or out of it. There are four or five rings, or belts, to it. It does not seem very hard. It must be an articulate. The rings seem like threads drawn round it to make it tighter in one place than another. I see a number of them. They are small. I see another animal, somewhat harder, that has a kind of brush at both ends."

(1.) Many such mountain-ranges and precipices have been worn down since that time.

(2.) This is probably the reason why so few have been preserved as fossils.

Here are seen by the psychometer seaweeds, articulates, and mollusks, in the form of gasteropods, and probably brachiopods, but small, and with fragile shells. The Cambrian rocks have yielded to the geologist seaweeds, articulates, and brachiopods, all small.

EARLY LIFE-FORMS.

Calciferous sandstone from Ogdensburg, N.Y., examined by Sherman in 1866.

"I see a little insect crawling along in the dirt,

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that looks something like an ant. That is all I can see.

"I see another, a larger animal, that slaps the dirt with its tail. I have to look close to see them. This one is about an inch long. I see one of them now about two inches long. They have six legs. The sun is shining bright. It is very hot, — hotter than I ever felt it before.

"I see hundreds of those animals that pat down the sand. They bite. One almost took the skin off. (It grows dimmer as I take it from my forehead; but I can see them three inches off.) What millions I see now! There is about an acre all patted down by them (1).

"I see a curious animal, crawling like a clam; but it has no shell: it is leathery. It makes a track (2).

"I see a volcano in the water, and lots of hilly islands. One has sunk down. There is a little lake in the middle, and a round island like a ring. The lava flows into the water; and the steam rushes up in clouds. I can barely see the fire. There is quite a high mountain in the water. It makes an awful noise, — worse than any thunder. The lava runs in, and drains the water up for quite a distance. As it rushes in, it turns into steam all around, and leaves it dry. Great red-hot rocks come down with a terrible splash. Where they fall into the water, the steam comes up in great white bubbles for a long time. I can see the reflection of the lava, and the red stones, in the water. (When I turn the specimen, it seems another place altogether.) A rock fell just then as big as this house. It was thrown up almost out of sight" (3).

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(1.) The calciferous sandstone is in the Lower-Silurian formation, next to the lowest fossiliferous group of the United States. It was laid down at a time when life was almost entirely confined to the sea. Tracks, probably made by large crustaceans, have been found in the Potsdam sandstone below it, proving that living beings traversed the sandy shores as early even as that. The first animal seen by Sherman is the same previously referred to, which seems to have been very abundant at an early period.

(2.) The animal crawling like a clam was probably a tunicated mollusk, having no hard shell. The tunicata could leave no impression, save a track, recognizable by the geologist.

(3.) At this early period it is probable that volcanoes were numerous and very active, and most of them in the immediate vicinity of the ocean.

LIFE AT THE BOTTOM OF THE SILURIAN OCEAN.

The specimen was a slab of limestone from Richmond, Ind., examined by Sherman, May, 1873. The age of the specimen is probably about that of the summit of the Trenton limestone, of the Silurian formation.

"I see a fish about two feet long. It seems very soft-bodied, and has an enormous mouth. The tail seems clumsy. There is not a scale on it, and it has no teeth.

"At the bottom there are animals like lilies: they must be crinoids. This fish comes along, and snaps the flower-like head off. When the crinoid is tough, it takes hold, backs, and pulls it up. The inside

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of the throat is lined with short, sharp spines, that seem to answer the purpose of teeth (1). (Draws Fig. 1.)

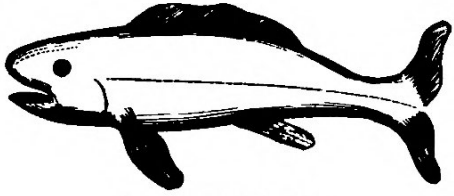


FIG. 1. — Crinoid-cater.

"I see almost a field of those crinoids, in bunches, five or six together, like a lot of lilies from a stem (2). I can see the parts that surround the head in motion, in and out, as if they were gills to fishes. Some have a reddish color, and others are dark brown: those seem to be the old ones.

"Now I see a very strange animal. I do not know what to call it: it seems to be part lizard, and part fish. (Draws Fig. 2.) The upper jaw projects.

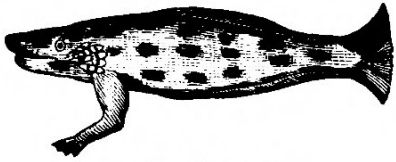


FIG. 2. — Fish-reptile.

It has no hind-feet. It moves its tail a while, and then its feet. The skin is smooth and spotted (3).

"There is an animal at the bottom, dead. It seems to be some kind of crustacean, or a fish crusted all over. I have seen pictures of animals something

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like it. It is about three feet long (4). (Draws Fig. 3.)

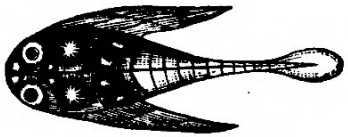


FIG. 3. — Star-plated fish.

"Now I see some small animals that look like water-bugs, such as make dragon-flies. They are very small and translucent.

"I made the fins wrong to that crustaceous fish" (alters them): "they are pointed.

"Now I see a strange animal. It is flexible in the middle, and moves by bending its body. It looks more like a leech than any thing else. It is soft-bodied, and about four inches long. It is very sensitive: when it touches any thing, it stops instantly, and then moves cautiously. It does not seem to see, but goes by feeling. (Draws Fig. 4.)



FIG. 4. — Leech-like animal.

"I was looking at the head of one of those crinoids. One of those water-bugs came along, and it

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was sucked right in; and the parts round" (arms) "closed upon it at once. Now they are opening very slowly (5).

"I see a worm now with a fringe all round the edge of it, so that it looks broad. (Draws Fig. 5.)



FIG. 5. — Fringed worm.

It seems like a leech. It has two small pincers, like a beetle, by which it catches small animals."

("Are there any plants?") "I see what look like plants, floating about, and yet growing. They are spread out like Irish moss. (Draws Fig. 6) I



FIG. 6. — Floating fucoid (?).

cannot really tell whether they are plants or animals. They are very fine.

"Those crinoid-eating fish often pass me. There seem to be a good many.

"Now I see a very long and thin animal. It is no larger than telegraph-wire, but is about two feet long. It moves like a snail or eel on top of the water. No: it moves like a worm. The forward part of the animal rests while it draws up the back part.

"Oh, I see! It is all covered with hairs, or bristles, about a quarter of an inch long. The head is

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sharp-pointed; and I cannot see any eyes. Every thing moves unusually slow."

("How deep is the water?") "Not very deep: the deepest not more than twelve feet.

"I see many of those crinoids washed ashore. They dry inside, and leave a hard shell that looks splendid. It is muddy in the water, but sandy along the shore. I see some crinoids sticking on the rocks, and out of the water; but they are dead. They are about two feet above the sea-level. There must have been an upheaval.

"I see some now on a hill-side thirty feet above the water; and such a lot of shells lying round like stones! Some that you have I will show you." (He pointed out *Rhynchonella increbescens* (Fig. 7) and *Strophomena planumbona* (Fig. 8) as among the



FIG. 7.
Rhynchonella increbescens.

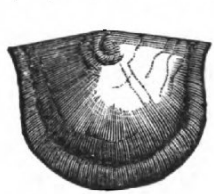


FIG. 8.
Strophomena planumbona.

shells seen.) "They are very beautiful. Those" (rhynchonellas) "are of a rosy color, and semi-transparent, very beautiful. The others" (strophomenas) "are of a translucent white, like a pearl button." (Laid the specimen down.)

In answer to questions, he said that there seemed to be a great deal of vapor in the air, so that he could not see far. "I saw rocks with cracks in them, but nothing growing on the land."

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Took the specimen up again. "I see no plant, but as strange an animal as I ever saw. (Draws Fig. 9.) It is dead, and on the edge of the water.



FIG. 9. — Strange animal.

The fore-part is horn, and the other fleshy. The under-part has a slit in it; so that it could open, and the horns cross.

"I do see vegetation now, like grass on the beach, with very fine blades like lawn-grass. It is very cloudy: I cannot see the sun at all.

"I see other vegetation now, a good deal like mullein, but no stalk. The leaves all spread on the ground. On looking closer, I see it is all divided like a fern."

(1.) No undoubted fish-remains have yet been found as low as this; but a fish of this description, destitute of teeth and scales, and having probably a cartilaginous skeleton, would leave behind it no fossil evidences of its existence. The tail is only slightly heterocercal, or unequal-lobed.

(2.) They receive their name (derived from the Greek *krinon*, "a lily") from their lily-like appearance. Crinoids have been found in the shales and limestones at Richmond, where the specimen was obtained. We find them fossilized in groups; so that they must have grown as he describes them.

(3.) This is apparently a perenni-branchiate batra-

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chian, or frog-like animal, with permanent exterior gills. In this respect it resembles the siren, proteus, and axolotl, but is much more fish-like than any of these. The oldest reptiles hitherto discovered are from the Upper Devonian; but they must have existed long before that time. We cannot expect to find the earliest reptiles or fishes in a fossil state, from the probably perishable nature of their skeletons. Further examinations will doubtless reveal many batrachian forms as old as this.

(4.) There is a strong resemblance in this to the placoganoids of the old red sandstone, known as the pterichthys and the asterolepis; and, although the skeleton was probably cartilaginous, the "crusted" scales may yet present to the geologist evidence of its existence.

(5.) This was doubtless the way that the crinoid subsisted. The mouth of the animal was in the centre of the arms; and, when they contracted, the centre of them was only a passage to the mouth.

THE TRILOBITES OF THE SILURIAN TIME, AND HOW THEY SWAM.

MAY 21, 1873.

The rocks at Braintree, near Boston, Mass., are generally regarded as primordial, — as old as or older than the Potsdam sandstone, — from the occurrence of a trilobite (*Paradoxides Harlani*) which belongs to a genus that has not yet been found above the Potsdam sandstone. I, however, think, from this and some unrecorded examinations, that the Braintree rock is younger than, or certainly as young as,

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the Trenton limestone. It is impossible for geologists to determine the age of a rock from a single unknown species, as has been done in this case. A great many statements confidently made in geological works will only remain till new and more reliable methods shall enable future students to learn their inaccuracy.

The specimen examined was a small fragment of a slab from Braintree, on which was the impression of the caudal shield of the trilobite *Paradoxides Harlani.* Examined by Sherman. Nothing known by him regarding it.

"I am about a mile from the sea. There is a great beach to the ocean, and a good many islands a little way off.

"I see some kind of an animal that looks like a trilobite; but I cannot tell whether it is or not. It is not a king-crab; for it has a great many little paddles on the under-side (1). It is about two inches long (draws Figs. 10 and 11), and has a very short tail.

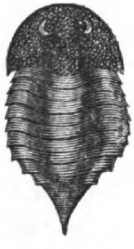


FIG. 10.
Short-tailed trilobite, upper-side.



FIG. 11.
Short-tailed trilobite, under-side.

The head is all covered with pimples like a frog's (2). Its eyes are like the eyes of insects.

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"Those paddles are quite soft and thin and translucent (3). (Draws Fig. 12.) They are in rows,



FIG. 12. — Paddle of a trilobite.

one behind another, and many in a row. There are hundreds of them, — as many as the legs on a thousand-legged worm.

"I see some in the water moving. They bend their bodies and straighten them out as they go along (4).

"I see another one, a good deal larger, and quite different. It has a plate elevated above the mouth, which looks as if it could shut down upon it (5). (Draws Fig. 13.) The mouth has a pair of nippers



FIG. 13. — Plate over the mouth of the trilobite.

like a lobster's, that are under the plate. It holds its food with that plate. There is a great deal of fine work on this animal underneath. (Draws Fig. 14.) It has a longer tail than the other, and it is all covered over with little spines. It has paddles underneath too.

"There is another animal here that looks very strange, though it resembles a trilobite. It must be a strange one if it is. (Draws Fig. 15.) The tail is very long.

"Some of these trilobites lie on the bottom, rolled up nearly as round as a marble (6). That seems to be the way in which they sleep. I see one breathing;

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and that plate over the mouth moves back and forward as it takes the water in and pours it out.

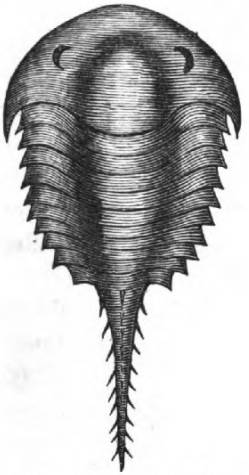


FIG. 14. — Spiny-tailed trilobite.



FIG. 15. — Long-tailed trilobite.

"They have so many paddles, they move with the greatest steadiness when they do not double up the body. They do that when they go fast (7).

"I see one doubled up that has a long tail. It stands up like a spine. All the trilobites I have seen are light-colored, like the shell of a horseshoe-crab when the animal has left it. I can see through the shell into the inside.

"I see an immense dead trilobite at the bottom of the sea. The rings have come apart; and I can see the paddles, — a row under each ring. On each side, the paddles turn outward. They are very fine and thin.

"The long-tailed trilobites like to float on the top

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of the water, and they are very lively. The little paddles do not keep time; but they are all in motion at the same time. There seems to be a great variety of trilobites here (8).

"I see one now about three inches long, with spines all over it nearly a quarter of an inch long. It has scarcely any tail at all. I see some that look just like it, only the spines seem to have fallen off.

"I think I see their eggs, — small eggs fastened to weeds; because, where the eggs are, I see a small trilobite not more than a quarter of an inch long. (Draws Fig. 16.) The eyes are unusually large for the size of the animal. The eggs are curious-looking things. (Draws Fig. 17.) The outside is like jelly,



FIG. 16. — Young trilobite.



FIG. 17. — Egg of the trilobite.

and the inside is a small brown spot. They seem to stick to the weeds, and are fastened to one another like fish-eggs.

"The eggs are very numerous: I see them on almost every weed. I do not see how this little one hangs on to the weed so well.

"I see some almost ready to hatch; and I can see the small trilobites inside. I can see them moving round inside, as if they were trying to get out.

"I can see one of those long-finned animals that I saw the other night. (Fig. 3.) It is a fish, I think. The front part is covered with plates that are flexible, like those of a soft-shelled turtle: towards the tail they are considerably harder. It is dead, lying

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on the bottom. The plates are higher in the middle; and small ridges radiate from the centre to the edges." (Improves his previous drawing.) "They are flat on the tail.

"I see another one now alive. When they want to eat, they turn over, the mouth is so far underneath. There is a soft rude tail connected with the spine: the spine passes through it. I did not see that before. It is so clear, that I can see the spine inside. It feeds only on dead animals that float on top, — trilobites and such like. The teeth are flat on top, something like a skate's" (9).

(1.) No feet of trilobites, nor paddles, such as Sherman describes, have yet been found: yet there is among geologists a general belief that the trilobite had membranous or foliaceous feet; but I feel quite sure that Sherman knew nothing of this at the time of the examination.

(2.) This is the case with many species of trilobites.

(3.) This is the reason, doubtless, that they have not been found in a fossil condition.

(4.) This motion of the trilobite, when moving, Mrs. Denton and he had previously observed, and had supposed that to be its only mode of progression.

(5.) This plate, called a *labrum*, is frequently found in a fossil state; but of its existence Sherman certainly knew nothing: yet the engravings are *facsimiles* from his drawings, the only clew to which he thus received by psychometric vision. Nothing can show more clearly the immense value of these inves-

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tigations. We shall, without doubt, be able to reproduce faithfully, in form and color, all forms of life that have existed on our planet. The means have been within our reach for ages; but we have now learned to grasp them.

(6.) Many trilobites had the power of rolling themselves up like a wood-louse; and we frequently find them in that condition in a fossil state.

(7.) They appear to have resembled the lobsters in this respect. When the lobster wishes to move gently about, it uses its membranous swimming feet; but, when it desires to dart through the water, it does this by the use of its powerful tail.

(8.) Two or three species of trilobites have been found at Braintree; but it appears that many more existed in the ocean in which these lived.

(9.) This is the fish seen with the specimen from Richmond, Ind., from rocks that are certainly as recent as the Trenton limestone, and probably no older than the Hudson-river group; and I think the Braintree rocks will be found to be as recent as this.

Mrs. Denton afterward examined, on the same day, a slab from the same locality, containing the impression of a trilobite, for the purpose of discovering how they moved through the water; but did not know where it came from, nor any thing of the previous examination.

"I see several different kinds of trilobites, and all of them different from this (1). One has spines all around the body." ("Look at the under-side of one.")

"There seems to be a light, jointed framework connected with the shelly covering of the upper sur-

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face by a thin, translucent membrane, remarkably tough, but very pliant. The joints appear to be composed of mere chips of a somewhat thicker membrane, or rather the same membrane thickened; and are united and held in place by it. This jointed frame is divided transversely and longitudinally, in, I think, exact correspondence with the transverse and longitudinal sections of the upper surface; while from every joint one or more little arms, or branches, descend, also jointed at the inferior extremity, from which joint issue several small paddles, or *paddlets*, every external edge of which is deeply fringed (2).

"These paddlets may be spread out or folded up, much like a fan, whenever the instincts of the animal require. Rapid progression through the water appears to be effected by curling up, and suddenly thrusting out, the posterior portions of the body. Whether the paddles aid in these darting movements, I cannot say; but, when the animal is slowly sailing about, they seem to be the only organs employed. When it is in a state of quiet, or rest, the paddlets have no perceptible action; but the fringes continually preserve a tremulous, wavy motion."

(1.) It is somewhat remarkable that neither psychometer appears to have seen the trilobite most commonly met with in the Braintree quarries; for its large size alone must have rendered it very conspicuous. Mrs. Denton may possibly have referred to it when she spoke of one "with spines all around the body."

(2.) The swimmerets of the lobster are fringed in this way; and it is highly probable, that, in the trilobite, the fringed membranous *paddlets*, or swimmerets,

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served to some extent as respiratory organs, as corresponding ones do in many living crustaceans. When the trilobites were coiled, they must have respired by the mouth, as Sherman saw them. He never observed these fringes, or the "jointed framework," to which, she says, the paddles were attached. It is possible, of course, that there was considerable difference among the trilobites themselves in reference to the existence and size of these fringes.

SILURIAN CRINOIDS.

About a month afterward, Sherman examined another fragment of the same specimen, knowing nothing of its character, or relation to the preceding specimen.

"I am somewhere a long way back. I see some crinoids at the sea-bottom. I see one with a head four inches in diameter. It is of a reddish-brown color." (He could not draw this well enough to satisfy him).

"I see others. They make those leaf-like arms move about, and can close them up and open them."

He laid this specimen down, and took up thoughtlessly a piece of rubber in the place of it, and then said, "I was in a forest right away. I thought there was something the matter."

Taking up the specimen, he went on: "I see a new kind of crinoid, white, and all closed up (1). (Draws Fig. 18.)

"Now I see a different kind, — quite different. I will draw that. (Draws Fig. 19.)

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"I see some coral now, or what looks very much like coral. It stands up in somewhat crooked stems,

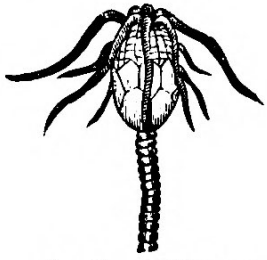


FIG. 18. — Cystidean.

like a forest, a foot or a foot and a half high, about half an inch in diameter, and nearly round. It covers a space about seven feet in diameter. On the very top I can see the animals.

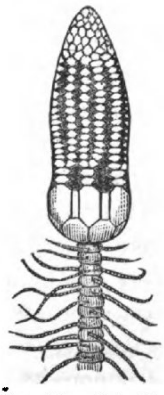


FIG. 19. — Crinoid.

"I see a crustacean like a crab, crawling along on top of the stalks, and pinching the polyps off. It is an ugly-looking thing. (Draws Fig. 20.) It is soft,

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except the claws." ("Are the claws very hard?") "No: I notice, when it squeezes hard, they bend in; but it pulls the polyps off in pieces with them, and then conveys them to its mouth.

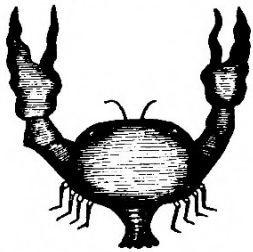


FIG. 20. — Polyp-eating crab.

"It is four or five inches long." ("Of what color?") "The body is light-colored, like a trilobite; but the claws are a dark-brown.

"I see pretty well; but I do not see very fast. I am on a hill at the sea-bottom.

"There are a great many of these polyps." ("Any sea-weeds?") "Yes: a great many fine ones like Irish moss. I see no large ones.

"Now I see something I cannot account for. I see a stone in between four of these coral stocks, a foot from the ground (2).

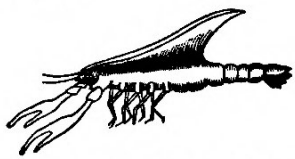


FIG. 21. — "Curious-looking crustacean."

"Now I see a curious-looking crustacean. I think it will look best sideways. (Draws Fig. 21.) It is

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not more than half an inch long. I thought it was alive; but it is dead, and this is merely the shell (3). I see several alone now.

"Well, I see part of a shell of a trilobite. It must have been a very large one.

"I can see a place where a trilobite has shed all its spines. There are a handful of them together. I should think you might find rock with trilobites' spines in, fossilized."

(1.) This, from its appearance, is a cystidean, — an animal allied to the crinoids, and to the echinoderms, or sea-urchins. The cystideans have not been found out of the Silurian formation.

(2.) The stone was probably taken up from the sea-bottom by the root of a fucoid, and dropped there.

(3.) Crabs have not been found by geologists lower than the Permean. The two crustaceans seen during this examination approach the long-tailed crustaceans more than most living crabs. These engravings must not be considered accurate in every detail, as the animals are only roughly sketched at the time, and finished when it is difficult for him to remember the exact appearance.

I have no doubt whatever that a psychometer could draw for a lifetime, and not exhaust the life-forms of the silurian alone. The early oceans swarmed with varied forms of life, and some, to all appearance, identical with living forms.

ANIMALS AND PLANTS OF THE COAL-PERIOD.

The great abundance of vegetable-life during the time when the coal-beds were deposited is now uni-

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versally admitted. The great variety of that life is becoming more evident from day to day as new forms are being brought from the darksome mines to the light of day. But, in the nature of things, we have discovered, and we can only discover by present methods, a few ruined fragments. What plants there must have been, whose leaves were too large or too delicate to be preserved! what fungi, whose texture entirely unfitted them for preservation! Of the leaves that have been found on the pages of the great stone-book, how little we know of the trees on which they grew, and how much less of the fruit they bore, and of the insects that buzzed around them!

The animal life of this period, as known to the geologist, consists exclusively of radiates, mollusks, a few articulates, fishes, and amphibians. Of the land animals we know scarcely any thing; and what Lyell wrote fifteen years ago is still true: "We have ransacked hundreds of soils replete with the fossil roots of trees; have dug out hundreds of erect trunks and stumps, which stood in the position in which they grew; have broken up myriads of cubic feet of fuel still retaining its vegetable structure; and, after all, we continue almost as much in the dark respecting the invertebrate air-breathers of this epoch as if the coal had been thrown down in mid-ocean." *

Psychometry is the glass that enables us to see those distant lands, and all that lived upon them; and it will yet make them almost as well known as those on which the sun shines to-day.

* Lyell's Manual, p. 402.

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COAL-PERIOD IN MASSACHUSETTS.

JUNE 16, 1873.

With a specimen of sub-carboniferous conglomerate from Fall River, Sherman came into *rapport* with what seems to have been the vegetation of the coal-period, and the animals existing at the time.

"I am in a thick forest, where the trees grow in water two or three feet deep. They look like coal-trees that I have seen in geologies. The bark is very rough. (Draws Fig. 22.) There are no limbs; and the top spreads out like a palm. The leaves are long but not broad. I will draw the end of one. Some are six feet long (1). (Draws Fig. 23.)



FIG. 22. — Rough-barked "coal-tree."



FIG. 23. — Leaf of the same.

"The trees are so thick here, that a race-boat could not be pushed through among them. They are so straight and tall, that, if only a few were left, it seems as if they would fall. They appear to hold one another up. They seem to be very soft-bodied, and to grow very fast, it is so moist here. The top

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of the trunk is green, like the stem of a weed, and juicy.

"There seems to be very little other life. I do not see any insects even.

"Now I see some animals that look like young crocodiles. (Draws Fig. 24.) The feet are webbed.

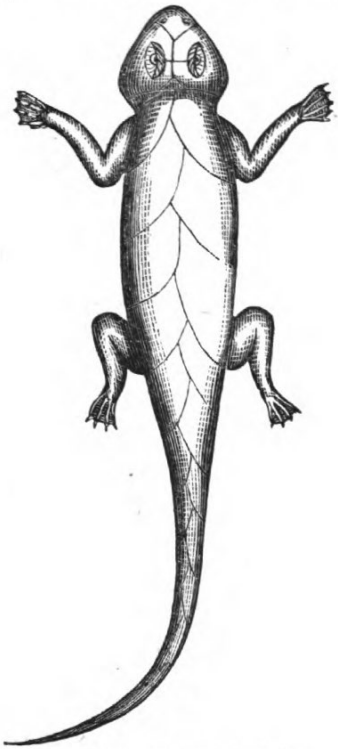


FIG. 24. — Broad-headed reptile.

There are four long toes, and a very short one, on the fore-feet, and only four on the hind-feet."

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("How large are they?") "One is about two feet long." ("What color?") "Very dark brown; nearly black. The hind-toes are much larger in proportion. It has few scales: they are large and soft, and can hardly be called scales (2).

"They seem to live on vegetables. I see one inside of a tree. It has eaten its way in; and its tail is sticking out. They are quite common." ("What are the teeth like?") "They are very small and sharp (3).

"The wood is very soft. They take it out by the mouthful, and spit it out. I guess they do not feed on it as I thought.

"Well, well! I see a hole in a tree. It is one of those lizard's nests, with eggs in it; soft like a turtle's, about the shape of a partridge's egg, and nearly white. There are four of them. The nest looks like a bird's nest.

"This is not nearly all they lay. I see in another nest as many as forty-six. They are heaped up.

"I see some of those reptiles climbing up trees. They climb pretty well: but they look curious, going up trees with their webbed feet; but I see none very high."

("What do they live on?") "They live on an animal like a water-bug. They catch them in the water, and come up to eat them. They have a hard shell: I should think they might fossilize. (Draws Fig. 25.) They are about an inch long.

"Many young trees are just coming up out of the water. They are white like a cabbage, and about that size. They are translucent; and you can see

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the leaves coiled up inside. (Draws Fig. 26.) They must grow very fast.



FIG. 25. — Ancient water-bug.



FIG. 26. — Bud of a coal-tree.

"A great many old and decayed trees have fallen down. There is a curious smell, like marsh-gas or sink-water. I do not like it: it seems as if it would choke me. The air seems dry to breathe; though there must be a great deal of moisture. There seems to be something wrong about it. That may be the reason there are not more animals (4).

"The lizards' nests are about a foot above the water level." ("What is the temperature like?") "Not extremely hot; about the same as here." (Eighty degrees Fahrenheit.)

(1.) This tree is apparently a sigillaria, one of the most abundant of the coal-measure trees.

(2.) The resemblance of this to some of the reptilian forms found in beds of the carboniferous formation is very great. It seems to have united some of the characteristics of the lizard with some of the frog. The living animal that it is most like is the plestiodon, or scorpion-lizard, which resides in trees, generally thirty or forty feet from the ground, and frequently makes its home in the deserted nest of a woodpecker. One species is said to attain the length of twenty-five inches.

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(3.) Several small reptiles have been found in the trunks of sigillaria, bearing considerable resemblance to the one Sherman has figured. In 1852, Profs. Lyell and Dawson discovered in the Nova-Scotia coal-measures two small reptiles in the interior of an erect tree; and, since then, Prof. Dawson has discovered four small reptiles in the interior of another. It seems quite likely that these reptiles were overtaken by a flood, and buried up with sand or mud while in their nests.

(4.) There was doubtless much more carbon in the atmosphere at that time; and that may account, in some measure, for the paucity of air-breathing animals which he notices.

WANDERINGS IN A PENNSYLVANIAN COAL-FOREST.

JULY 11, 1873.

The specimen examined was a piece of shale containing the impression of a fern-leaf from near Pottsville, Penn. Specimen seen. Examined by Sherman.

"I am in a coal-forest. I see a greater variety of trees than I ever saw before in the same period. (Draws Fig. 27.) The one I am drawing now has no branches, but long leaves that reach from the top nearly to the ground. They are as much as, or more than, ten feet long. The tree is small. It grows under the shade of the large trees.

"Some of the trees are quite deep in water, — six feet, I should think. They are like water-plants. I see a strange one, tall and slim, and that leans over. It is deep in water too. The points of the leaves

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are all turned toward each other. These leaves are as long as a man, and hang down by what look like



FIG. 27. — Long-leafed tree.

ropes. All up the trunk are what look like small leaves. (Draws Fig. 28).

"I see another curious leaf on a tree that is bent over, and has a long, small trunk. The bark is quite smooth. (Draws Fig. 29.) The leaf is three or four feet long (1).

"Here is a very beautiful little plant. It seems to be an air-plant, and clings to the trees. I hardly ever saw so pretty a plant. (Draws Fig. 30.) The roots twist round the trees. It is nearly of a brick-red color, but is black at the centre of each curl, where there is a white blossom that looks like the silk of the silk-weed. An immense number of fine white silky threads come out of a black centre that forms a kind of cup. Some of the plants are a foot long.

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I see one open now; and inside are one pistil and six red stamens, and then those silky threads. These plants only seem to grow on trees that are slanting.

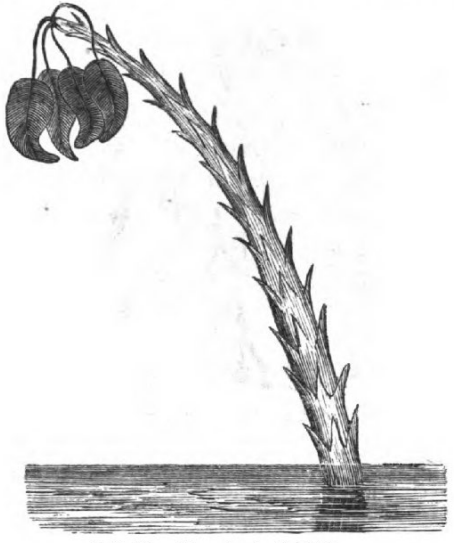


FIG. 28. — Hanging-leafed tree.

"I see another quite handsome air-plant clinging to the trees with its roots. (Draws Fig. 31.) It has a bulb about an inch in diameter at the bottom. At the top is a kind of blossom of a dark red: the rest is green. There are a great many of them (2).

"I see that great tree-fern that I saw before and drew (Fig. 22). There are many of them.

"This (Fig. 32) looks like a large tree two feet in diameter; but it is nothing more than an immense reed, perfectly hollow, about half an inch thick. (Draws Fig. 33.) An axe would go through it at one blow.

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"There is something curious about these hollow trees. They stand in water six feet deep; and you



FIG. 29. — Large fern-leaf.

can look in to the bottom, and there is not a drop inside. The roots are hollow, going off from it; and there is none in them."





FIG. 30. — Parasitic plants. — FIG. 31.

(1.) This is evidently a fern-leaf; but it differs from all that I have seen figured: indeed, all the plants figured during this examination appear to be peculiar.

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(2.) Air-plants are found to-day almost exclusively in warm and moist regions, and they prefer shady



FIG. 32. — Hollow tree.

situations. The climate and forests of the coal-



FIG. 33. — Part of the trunk showing the interior.

period must have been peculiarly fitted for their development.

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About a week afterward I tried him with another specimen of shale from near Pottsville, Penn. On this occasion, nothing was known by him regarding it.

"I seem to be in an extremely thick wood, and I see some singular-looking trees. (Draws Fig. 34.)

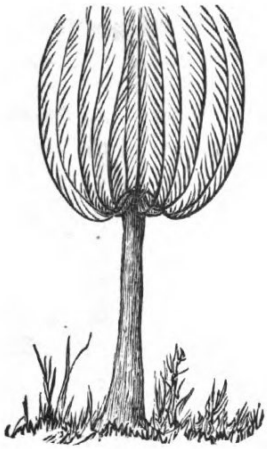


FIG. 34. — Soaring-branched tree.

They are not tall: the trunk is not more than ten feet high. They do not seem to be deeply rooted, or the ground is very soft. Dirty-looking streams run through here.

"I see some curious kind of land-snail, that seems to be round the stump of a tree. (Draws Fig. 35.) I see others, and some round live trees. The shell is tightly attached to the tree. I see the marks of some on trees that have grown too large for them.

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"It is not a shell, but the covering of an animal, — its house. It can leave it. It is not a snail, but a



FIG. 35. — House of a crustacean.

crustacean; and it is very nimble. (Draws Fig. 36.) Sometimes there are two in the same shell. I see a very curious one. The tree has branched, and the shell branches, so that it can go up either. They are good climbers. Some are on the tops of trees thirty feet high." ("What do they feed on?") "I see one feeding on a worm that it has pulled out of a hole in the tree. It stops out of the nest for some time.



FIG. 36. — House-building crustacean.

"I see some now making their houses. They begin at the large end, and use some kind of mud. They make it thin with their teeth, which are large and flat, one on each side. It looks dark when first put on, but becomes lighter afterward. It is polished in some way on the outside; so that it looks like shell. The animal is five or six inches long.

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"I see mud sticking on the hair of the tail. After they get up, they take it off with their claws, and use it. They are laden with clay as bees are with pollen.

"I see another singular crustacean, that does not live on trees. It has a dirty look. (Draws Fig. 37.) The claws are large in proportion to the body.



FIG. 37. — Oval-bodied crab.

"I see a very handsome horned land-snail. (Draws Fig. 38.) It is yellow and black. The four horns at the top are yellow. It is about three inches high; and has three whorls, large and thick. They must increase with age; for I see some young ones, with only one bulb and four small horns.



FIG. 38. — Four-horned land-snail.

"Here is something like Neptune's cup: it is hollow at the top, and is, I think, a kind of fungus. It is nearly black, and four feet tall, and quite even. (Draws Fig. 39.) It is very soft inside; and there are pimples all over it, but quite soft.

"It will hold water. I see some with water three inches deep in them.

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"I see some old ones that have died, and left only the skeleton; and that looks prettier than the living plant. (Draws Fig. 40.)



FIG. 39. — Cup-fungus.



FIG. 40. — Skeleton of cup-fungus.

"One of them is taller than I can reach. Five or six persons could stand in it, if it would bear them. It is not as tall, for its size, as the other.

"Another fungus is something like a puff-ball. The dust keeps rising from the top like smoke. It is about a foot in diameter; and the dust keeps slowly rising all the time like steam. (Draws Fig. 41.)

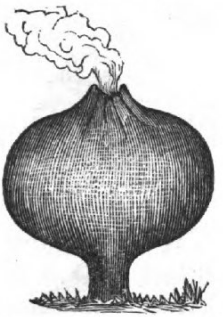


FIG. 41. — Ancient puff-ball.

"This is a great place for fungi. The black cups are very conspicuous. I see them everywhere in great numbers. Another kind is curled over at the

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top. It is brown: most of them are black. (Draws Fig. 42.)



FIG. 42. — Curly-topped fungus.

"Some of those fungi must have sent out that dust for a long time; for it has gathered on the under-side of leaves above them. The leaves being damp, it has stuck to them (1).

"I see a very handsome moth on a leaf. (Draws Fig. 43.) The body is about four inches long. The

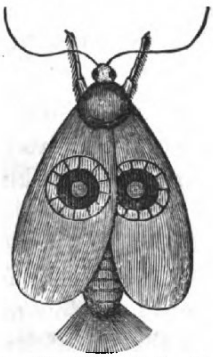


FIG. 43. — Hair-tailed moth.

wings are not spread. The colors — brown, red, and blue — blend into each other. It has white radiating hairs for the tail" (2).

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(1.) There must have been a great many fungi at a time when heat, moisture, and shade were so favorable to their development; and, for the same reason, we may suppose that they would attain an unusual size; but, owing to the softness of their structure, the geologist knows nothing of their existence.

(2.) Insects have been found by the geologist as low as the Devonian; and dragon-flies, ants, locusts, beetles, and a small moth, it is said, in the coal-measures. Some favorable locality in these beds may yet yield us other moths and butterflies, which the psychometer finds at that time, and which the necessities of the plants of the period would seem to require. The fruits of the time, many of which have been recently found in the carboniferous beds of Illinois, indicate flowers that preceded them; and these, insects that assisted in their fructification.

ANIMALS AND PLANTS OF THE COAL-PERIOD.

AUG. 5, 1873.

Specimen of black shale, containing impressions of ferns from a coal-mine near Pottsville, Penn.

"The first thing I see is a snake." ("Are you in a coal-forest?") "Yes; but the ground is high. There are brown blotches across the body. It is a light ash-color, and five or six feet long. (Draws Fig. 44.) It seems to be a slow mover. It is hanging on a branch by the tip of its tail. Its head is very large for the body (1).

"It is not slow when any thing is to be devoured. A grub was just coming out of a hole in a tree near; and it seized it instantly, and pulled it out.

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"These grubs are very destructive to the trees. I see a tree with the bark off; and the whole is hollowed out in square holes, as far as the tree is large enough. (Draws Fig. 45.)



FIG. 44. — Broad-headed snake.



FIG. 45. — Trunk eaten by grubs.

"There is just enough wood left to form a partition between one cell and another. The cells are all of one size from bottom to top. These cells are where they live. In other trees the bark is on; but they are just the same inside. There is only a round hole to tell where they are. All the holes are on one side of the tree. The grubs are black.

"It is a palm-like tree, with large leaves; perhaps a dozen on each tree.

"There is a terrible thunder-storm now. How the lightning darts! It sets the woods on fire in several places. When the fire gets to the trees where the grubs are, you can hear them pop and *siz*, one after the other, as it roasts them.

"I saw the lightning strike some dry trees, and burn; but, when it came to the regular coal-trees (sigillaria, &c.), it stopped. They seem to be too moist to burn."

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("I wish you would go up high enough to see over the face of the country.")

THE OCEAN DURING THE COAL-PERIOD.

"I have got to the ocean. It looks horrible! — all covered with logs, trees, and branches, and even floating islands, with trees growing on them. All that the tide can do is to lift this mass up, and let it down." ("Are you sure it is the ocean?") "I cannot see across it; and it is salt.

"In another place I see where trees have grounded, and formed a fixed island, with trees to the very bottom. On it are very tall trees, and many forms of vegetation. The trees, grass, bushes, vines, and logs are piled up all along the coast, and for eight or ten miles broad (2). It looks like desolation. It is enough to make one sick to look at it. It looks pleasant toward the land.

"That is very strange! I see dim flickering lights among the decaying logs. The trees are piled up in places, so that there are dark caverns; and there I see them. They go out, and then come in again" (3).

("Go out on the ocean.") "I see how they get piled up: it is done by the dashing of the waves. They are piled up fifty feet high, I believe. There are many stray logs, brush, twigs, and stuff on the ocean, and trees, with vines twisted round them, floating about. In storms they are dashed up on the heap. The waves come in in great swells. It would take an hour to walk a mile here.

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"I see a strange kind of blossom drifted out here, but quite fresh. (Draws Fig. 46.) It is nearly red, or light red."



FIG. 46. — Pentremite.

(I looked at the drawing, and said, "Are you sure that it is a blossom? Put it in the water.") "I see one in the water. It is stuck to a log in the water." ("What do you think of it now?") "I rather think it is a radiate; but it looks just like a flower, with a pistil and several stamens. It is quite hard. I should think it would fossilize. It has what seems like a sucker, with radiating roots, by which it attaches itself to things" (4).

(1.) Serpents have not yet been found in the rocks below the tertiary formation; but, from the great size of the lowest yet discovered, — twenty feet in length, — we may expect to find them much earlier than this. The one figured here has a much larger and broader head, in proportion to its size, than that of any living ophidian.

(2.) Although most of the beds of coal have their accompanying under-clays, with roots ramifying through these soils in which the coal-plants grew, yet it is highly probable that some coal-beds were formed along the margins of the carboniferous seas from the abundance of vegetation swept down by the streams from the luxuriant forests that overspread the country.

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(3.) Decaying vegetation produces similar phosphoric emanations to-day.

(4.) This radiate animal, which he mistook for a flower, is evidently a pentremite, which, like the cystidean, forms a link between the crinoids, or lily-like animals, and the echinoderms, or sea-urchins. It was supported by a jointed stalk like the crinoids; but in the shape and character of its plated receptacle, and in the absence of arms, it resembled the echini.

FLOWERS IN A COAL-FOREST.

AUG. 6, 1878.

The same specimen.

"I see a coal-forest, and a curious kind of plant about a foot high, with a green blossom. It springs right out of the ground. It has only three petals. (Draws Fig. 47.) It is surrounded with arrow-



FIG. 47. — Green blossom.

shaped leaves. There are so many stamens, I cannot count them; but only one pistil.

"I see a very handsome plant now, about ten feet high, with a large red-and-yellow flower on the top.

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(Draws Fig. 48.) The plant looks something like a sun-flower, and the flower has a perfect cross on it.



FIG. 48. — Cross-flower.

"I see some curious pods on a tree, something like locust-pods. They are green. They hang in clusters. The tree has very fine leaves. (Draws Fig. 49.)



FIG. 49. — Pod-bearing tree.

"There is an extremely large pitcher-plant here, eight or ten feet tall. It is reddish-brown, and the

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leaves green. (Draws Fig. 50.) It is full of water. It has a graceful look (1).



FIG. 50. — Gigantic pitcher-plant.

"An air-plant is growing on the under-side of a limb, and hanging down: it has a pale-blue blossom. The plant is dark green, and the centre of the blossom dark blue. (Draws Fig. 51.)



FIG. 51. — Ancient air-plant.

"One tree has fallen between the trunk of another and one of its limbs; and there the tree has grown till

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the one that fell is in the centre of it; but it is dead. The trunk looks as if it were shingled.

"There is an insect here very much like a mosquito: but it is not one; for I see it sucking the juice that comes out of a tree. The juice is very sweet. It seems to me that these trees are full of sugar. The sweet juice is running down the tree in a small stream. I have noticed it running out of these trees before (2).

"I see handsome green fungi all over the trunk of a tree that has fallen down. They are the shape of a toadstool at the top, about as large as a nickel cent, and eight or ten inches high."

TREE-CLIMBING MUSSEL.

"I see a kind of mussel out of water, and hanging on to a tree like a mussel to a rock. There is a small muddy stream about six feet from the tree: the water looks like that which flows from swamps. The shell is striped with different shades of green. The tree hangs over the water.

"It is not uncommon. I see some of them twenty feet above the ground. When any thing touches them, they squirt a stream of water in that direction. I saw a beetle come up to one: it shut in its head and legs as quick as possible.

"They go up a tree in a spiral, eating into it all the way up; so that the mark looks like the thread of a screw. The bark of the tree is as smooth as birch, and soft. There are about twenty trees here that have numbers on, some very small. The trees are all scored. At the bottoms of some trees I see hundreds of shells that have fallen down. All the trees are

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close to the brook. I see six all together round a little knot.

"On one place, where the sun shines through the trees, I see three or four dead: they are cracked open, and dry inside" (3).

(1.) The pitcher-plants of the present time grow in boggy situations.

(2.) Sherman has frequently noticed sugar-bearing trees, not only in the carboniferous formation, but in some of the younger, up to the pliocene tertiary; and has observed monkeys breaking the branches of the trees, and sucking the juice.

(3.) At a time when the atmosphere was as moist as it was during the coal-period, it would be easier for mussels to do this than at any more recent time. They probably obtained from the bark of the tree all needed sustenance.

COAL-PERIOD IN RHODE ISLAND.

AUG. 4, 1873.

The specimen examined was a piece of bituminous shale, containing impressions of ferns, from Valley Falls, R.I. Specimen seen and known.

"Well, I do not seem to be exactly in the right place. I am up where it is high. There is no water, but a great many trees. The bark of the trees looks much alike; but the leaves are about as different as they can be. (Draws Fig. 52.) No two lobes are alike.

"I see another very strange leaf somewhat on the same plan. (Draws Fig. 53.) The first one is about six inches long, and this about a foot. They are very thin.

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"One tree has leaves that are glossy, and look as if they were varnished. They are quite thick, and about

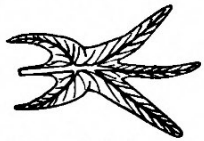


FIG. 52. — Unlike-lobed leaf.

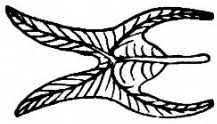


FIG. 53. — Four-lobed leaf.

three or four inches long. (Draws Fig. 54.) The tree is perhaps fifteen feet high.

"This is the strangest leaf. It is on a very tall tree, but is not more than five inches long. (Draws



FIG. 54. — Thick glossy leaf.



FIG. 55. — Compound leaf.

Fig. 55.) The lobes are the same shape, and the leaf is about as thick, as an oak-leaf.

"Some extremely large leaves grow on a plant about ten feet high, and reach from the top to the

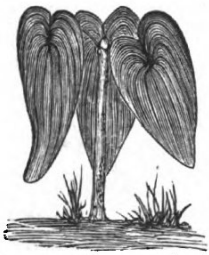


FIG. 56. — Three-leafed tree.

bottom. (Draws Fig. 56.) There are only three

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leaves on it. It has a singular-looking green fruit, about a foot high, on top of the stalk. (Draws Fig. 57.) I do not think the fruit is ripe. It is like an acorn in its cup. The veins in the leaf are very distinct, and have deep hollows between.

"There is a curious leaf on a thick-bodied tree about fifty feet high. (Draws Fig. 58.)



FIG. 57. — Fruit of three-leafed tree.



FIG. 58. — Tapering pinnate leaf.

"I see some very strange-looking flowers now growing on a plant about two feet high. They are nearly all pink; have six stamens and one pistil nearly black. The very edge of the end of the stamens is black, and



FIG. 59. — Large-blossom plant.

the rest pink. (Draws Fig. 59.) It only bears one

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blossom. The stalk is square; and on the edge are little spines that make it look like sickle-grass.

"There is a very fine tree full of splendid-looking fruit. It is yellow, and about two feet long. (Draws Fig. 60.) The branches bend over with it. There is a fuzz on the outside, such as a peach has.

"It has a very pleasant taste, very much like a pleasant sweet apple, and is very juicy. A whole one would be about as much as a person could eat (1). Where the fruit has fallen, there are many beetles feeding. The largest is a light-brown one, with large nippers. (Draws Fig. 61.) It is about five inches



FIG. 60. — Large yellow fruit.

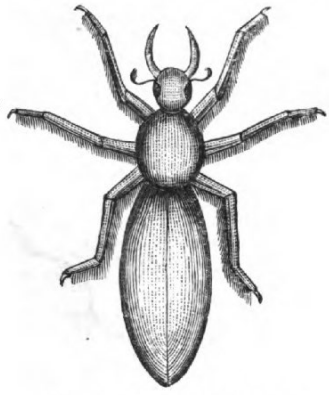


FIG. 61. — Fruit-eating beetle.

long. It keeps its nippers going all the time. There are a great many beetles here, and even land-snails too. Would they feed on these fruits?

"I will draw another beetle, — the strangest one I see. It is metallic green, very handsome. (Draws Fig. 62.)

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"I see a very curious land-snail. The shell only covers a part of the body. I do not know how to account for it. The animal looks as if it were inside

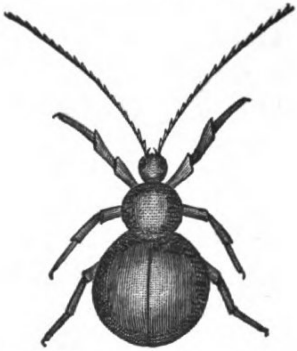


FIG. 62.—Metallic green beetle.

of a spiral spring (2). One can see the body black, while the shell is white. (Draws Fig. 63.)



FIG. 63.—Rib-shelled snail.

"These beetles fly round in the daytime; and there are a great many wasps and bees."

(I thought it possible that he had unconsciously passed to some other period; and I said, "Are you sure that this is in the same time?") "Yes," he said: "it is. I see one of those hollow trees (Fig. 32), and one of those ferns (Fig. 22).

"One kind of insect is a wasp, black and yellow; another is like a honey-bee, but a little smaller; a

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third like a bumble-bee, but larger. They are sucking the sap that flows from the trees (3).

"Insects flourished then: there were neither birds nor reptiles to catch them.

"I see a kind of melon on a vine on the ground. It is about a foot long, and six inches through."

(1.) It has generally been supposed that nutritious fruits made their appearance upon the globe a short time only before the advent of man; but this, like a great many conclusions that have been found quite erroneous, rests merely upon negative evidence.

(2.) Land-snails have been found in the coal-measures of Nova Scotia and Illinois.

(3.) The earliest bee known to the geologist is incased in the amber of the tertiary; but, as there were certainly flowers in the coal-forests, why not bees?

Before the statements made in these examinations can be accepted, they need to be verified by the independent testimony of other psychometers. Many other examinations I shall reserve until I have had an opportunity of thus verifying them, and establishing their correctness beyond all reasonable doubt. The harmony of most of the statements advanced, with what we know of the carboniferous period, must be apparent to any one conversant with that time as geology reveals it.

THE CONNECTICUT VALLEY AND ITS ANCIENT INHABITANTS.

The valley of the Connecticut, from the Massachusetts line to Long-Island Sound, is one of the most

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interesting regions in the world to the geologist. In this valley we find sandstones, which are, in the aggregate, thousands of feet in thickness, as revealed in places by their upturned edges; and through them, over a space about a hundred miles long and from two to four miles broad, are found the tracks of a great many animals, some of them so remarkable, that it has seemed to many persons incredible that animals ever lived whose feet could have made such monstrous impressions. By the labors of Dr. Deane, Dr. Hitchcock, and others, much light has been thrown upon the strange forms that wandered along the muddy shores of gulf and river, and left their autographs on the red pages.

But, if it is difficult to construct an animal from its bones, how much more difficult from its tracks! It was long before Dr. Hitchcock could be satisfied that any of the tracks were made by birds; though they generally have long been called "bird-tracks:" and even to-day there are geologists of some eminence who deny that we have any evidence that birds existed at the time of the deposition of the sandstones of the Connecticut valley.

Can psychometry repeople this valley? Can it lower the whole country, call up the ancient tides, and leave the broad beaches covered with red mud as they recede, and send the monstrous birds and strange reptiles down to fish as they did in that time so long ago? The following examinations, which are only a small portion of those that have been made, will reply.

The specimen examined was a fragment of a sand-

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stone slab from Turner's Falls, containing footprints. Examined by Mrs. Denton in 1866. Nothing was known by her regarding the age or locality of the specimen.

"I am in a river-valley with this specimen, and in the long-past time. The animals and vegetables were very different then. (There are several different influences; and I can follow one nearly as well as another.) I see people now. One minute I am back beyond all human beings, and then I am among early people and later times. The true time of this is, however, a long way back of the human period.

"The river of this valley overflows its banks, and settles back into the land, forming shallow ponds and lakes. It is a dirty stream. There are wide, shallow places in it, where it does not look so much like a river. It seems to grow wider as I look at it, and has more the appearance of a shallow sea. This is a long way back in time. The air is loaded with fog or steam: I think it is steam (1). I do not like the feeling at all. There seem to be abominable things all around; but I cannot see them. The water and mud below seem stirred by animals all the time. Land and water are both very warm; but it does not seem to result so much from the direct rays of the sun as from the geological and geographical conditions of the region.

"There is a place at some distance to the west that looks high and dry and pleasant; but it is very rocky." ("Taste the water.") "I cannot. It is filthy. It seems brackish. This is, I believe, an arm of the sea, extending a long way into the land. It is

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the dirtiest place I ever got into. I cannot bear to stop here. I obtain glimpses of animals, but nothing distinct in that line. Judging by the feeling, there are many reptiles here of various kinds, and many fowls that seem to live almost as much in the water as out of it. Even they do not seem like neat water-fowls; but they have waded and wallowed in this filth until they appear to have become part and parcel of it. Their flesh is sinewy, and has an exceedingly strong and disagreeable odor, from which no amount of washing could cleanse it. A terrible stench arises from the whole region; so that I think no human being, certainly none who lives now, could exist within many miles of it. I cannot compare the sensation I experience to any thing I ever knew or conceived of before. The water itself is impure. It holds something besides salt in solution. I have never before seen so filthy a place. Nothing but fire could ever purify either the place or its inhabitants.

"I see a bird now that looks like a Connecticut-valley bird (2). It has those same coarse feathers. It is large and long. The legs are very long. It is close to the river. The water is purer now, and runs more like a river. (This seems like a more recent time.) There are immense numbers of small fishes in the water, that furnish food for birds. These are a cleaner kind than those I sensed before. They are of a brownish color, but have not feathers all over them. The skin is dark colored. I think some of them must be as much as six feet high. The feathers are principally on the edge of the wings, and on the back.

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"I think this is the Connecticut valley; but it seems farther back in time than the specimens I have examined before."

(1.) While the sandstones of the Connecticut valley were being formed, the valley appears to have been subject to considerable disturbance. At times it was an arm of the sea, even beyond where Turner's Falls now is; then the valley was uplifted, and a river ran through, and over rocks, to the ocean below; and these conditions seem to have alternated several times. Accompanying these changes of level was the formation of crevices down to the fluid interior, from which were poured streams of lava. Portions of the trap-beds formed from those streams are at this time a remarkable feature of this valley.

(2.) In previous examinations, some of which are recorded in the first volume of "The Soul of Things," she had seen birds with coarse feathers.

BIRD-TRACKS OF THE CONNECTICUT VALLEY, AND THE BIRDS THAT MADE THEM.

In 1867, Sherman examined a small piece of a slab from Turner's Falls, above Greenfield, on the Connecticut River, knowing nothing of the specimen.

"I see a track on the mud: it looks like a bird-track. I'll measure it. It is thirteen and a quarter inches from the heel to the end of the claw (1). Would you track it up?

"I have come across the bird. It is a great, long-necked thing, and has a very large body. I can just

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put my elbow, on tip-toe, to the top of the hip" (four feet five inches). "The body — oh, such a big body as it has! It is short-legged for the size of the body. It is eighteen inches round the neck, and six feet eight inches round the body just behind the legs. It is real clumsy. It is not a flying-bird. It has little, short wings; and it flap, flaps them to help itself along. There are as many as a hundred of these birds walking along. They are running now; and this one opens its mouth, and runs toward them. They are larger than it. It is one of the smallest of the lot, except some young ones I see. The tail-feathers are short, fine, and bunchy, like a dodo's tail: they are white. The feathers on the body are brown; some a very dark red, almost brown (2). (Draws Fig. 64.)

"Now they are going along, making tracks. One of the birds is very large. I can just reach to the top of his hip with my middle finger. The bill is not very long, and does not go to a peak, but is rounded. They eat green grass, and a white kind of weed that grows on the land. They reach up to a tree with large leaves, and eat them too."

(1.) The measures were made with a common tape-measure. He slid the tape along with his fingers, his eyes being closed, till the place was reached that seemed to him right; and I read off the numbers.

(2.) This is probably one of the smaller species of a bird, whose tracks are quite abundant in the valley of the Connecticut, named by Dr. Hitchcock *brontozoum*. The tracks of the *brontozoum*, however, do not give any indication of webbed feet, and the toes

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appear wider than these are indicated: but, where the mud was soft enough to receive the impression of the web, it may have been too soft to retain it; if harder, it may have been too hard to receive the impression. The tracks would generally be wider

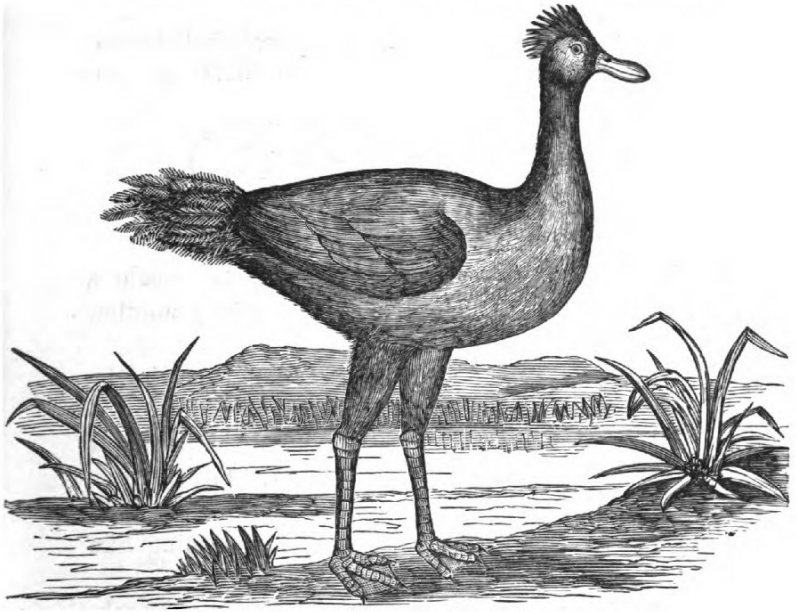


FIG. 64.—Large web-footed bird of the Connecticut.

than the toes. The engraving represents a bird that resembles the ostrich more closely than any other existing form: but its neck is shorter and larger in proportion, while its body is smaller; and it has a crest, of which the ostrich is destitute.

I gave him for examination, about two months ago, a small piece of shale from Sunderland, above North-

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ampton, in the Connecticut valley. It was from a slab containing fossil fish. He knew nothing about the specimen, but described very similar birds.

"I seem to be near a small body of water, — I suppose a pond, but long. I see something like a water-newt.

"Here is the track of some large, web-footed monster, I know not what. (Draws Fig. 65.) It is as



FIG. 65. — Tracks of a larger web-footed bird.

much as a foot long. I see where it has made a scrape, as if with a nail; and then comes another track.

"A curious kind of worm is crawling along in the mud.

"I am following these tracks around the pond. I see now what makes them: it is a large bird, that is sitting down. It is much larger than an ostrich. (Draws Fig. 66.) I have seen one something like it, but not exactly" (1).

("What are the feathers like?") "On the neck, back, and breast, they are fine; on the wings and tail, coarse. Most of them are dark brown; but the tail is a little lighter than the rest.

"I see a number of those ponds all strung along like sausages, and about that shape too. These birds are gobbling up great frogs, larger than a bull-frog, but almost the same shape and color. I see one bird at each pond. The ponds are all joined by small streams.

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"These birds go strutting along, not hopping like the kangaroo-reptiles."

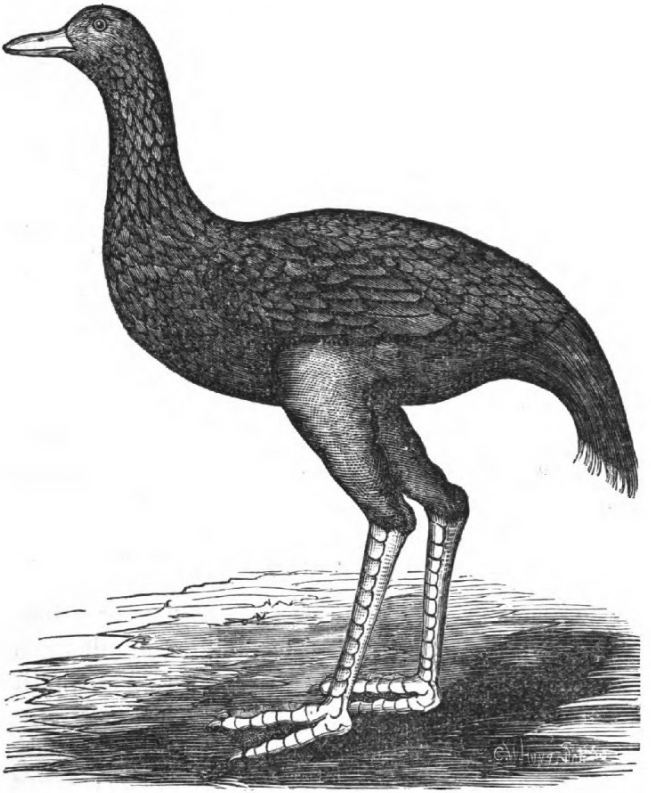


FIG. 66.—Larger web-footed bird of the Connecticut.

("See where the water from those ponds flows, and examine the country.") "It is very flat. On each pond is a kind of beach; and between them prickly bushes grow very thick. It would be impossible for a man to make his way through them.

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"I see a river now, flowing very slowly, ten or fifteen miles from the ponds. The streams from the ponds unite, and flow into this large river.

"Those birds go round like great Shanghais. The tail is not as white as that bird's I painted (Fig. 64). Its legs are bare, — so bare, that I can see the flesh through the skin, — and very large. It could not fly, but would sometimes hop, and flap its short wings.

"I see another one, larger than the first. My finger-ends can just rest on the top of the leg" (six feet eight inches).

(1.) Many different species of gigantic birds frequented the Connecticut valley during the deposition of its sandstones, and many whose footprints may never be discovered.

This must have been a bird about twelve feet high, or as large as Hitchcock thinks the largest bird was whose track has yet been found.

THE KANGAROO-REPTILE.

The specimen, which was a slab containing a footprint, from South Hadley, was examined by Sherman on June 21, 1873. He knew what it was, and that it came from the Connecticut valley.

"I see a large river; and on the sides are muddy banks for miles, and hardly any vegetation near: the mud is pretty hard, — dried by the sun. It seems to overflow its banks, and make it muddy for a mile or two back from the river, the banks are so low. Here and there are bunches of bushes, with mud all round them, that look like islands.

"I see a turtle, with a shell about two feet long.

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It seems harmless, and does not differ much from turtles we have now. It has a blunt nose. There is green moss on its back.

"Away up on the side of this muddy place are hundreds of those turtles laying their eggs. It is quite sandy up here. There is another kind, with very long claws, that bend up in the middle when it walks; so that only the heel and the points of the claws reach the ground.

"I see some kind of a reptile with a long tail, short fore-legs, and long hind-legs, that goes like a kangaroo (1). (Draws Fig. 67.) The skin is bare and leath-

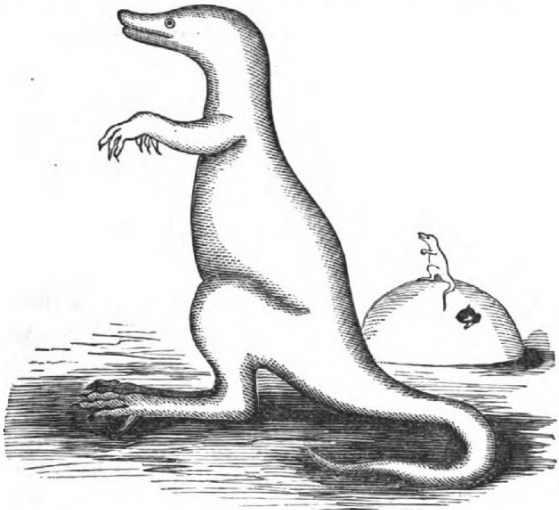


FIG. 67. — Kangaroo-reptile.

ery, and quite dark, — a very dark brown. Its head is very long." ("How many toes?") "I thought it had five on each foot; but I find it has four on the

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hind-feet, and three on the fore-feet. Its fore-feet are not used much, except when it is eating. It takes its food like a squirrel, — with its fore-feet. Its food is miscellaneous. I saw it eat a frog, and a vegetable that looks like a cabbage. Its teeth are in the shape of saw-teeth, but not as thin as that. The hind ones are broad on top, for grinding.

"It can hold very well with its fore-feet and claws. I saw it hold a frog with one, and a cabbage-plant with the other, and eat, first one, and then the other. It hardly seems to be a reptile, going round in this way. It really seems like a mammal; but it has no teats (2).

"They walk round in the water the same way, nearly up to the neck. On the land, they look like great bull-frogs as they go hopping round. It is taller than I am when it stands up, — a foot higher than my head." (That would be six feet eight inches.)

"I do not see them swim at all; though I see three or four wading.

"They make curious tracks as they go along on the mud, — two big ones, and two little ones, — when they are after the frogs; but at other times they hop three or four times without touching the fore-feet, and just make the two large tracks, till they rest; when they always put the fore-feet down before they sit up.

"I notice that the small toe on the hind-feet does not make an impression unless the mud is very soft. It is like the spur of a rooster. The reptiles have been squatting down here; and I see the impression of the leg as far as the knee-joint (3).

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"They are not mammals; for I see a nest, with a little one just coming out. At the edge of the hole I can see some egg-shells. It is standing on top of the nest, which is about five feet high, and looks like a muskrat's nest.

"They are just hatching out. Every one makes a hole for itself. Another has just broken out. They are very lively, and seem to know just what to do. What little bits of tracks they make! They are hopping round now. The eggs are about as large as ostrich-eggs, but rougher on the outside, and nearly round. The shell is soft, like the shell of a turtle's egg, but has little round pimples all over it. The inside shows slightly through the shell, and that gives it a yellowish look.

"As soon as the young ones hatch out, they eat some part of the egg that is left. It looks like the white of a hen's egg. The old ones pay no attention to them. They go down to the water as soon as they get out and get fairly to going. Their teeth are almost as sharp as needles.

"I see a whole drove of these little fellows. They keep together. They make a squealing noise all the time."

THE PTERODACTYLS OF THE CONNECTICUT VALLEY.

"I see some kind of a reptile that comes down and tears open these nests, and sucks the eggs. It is a great bat-like reptile. I believe it is a pterodactyl. It sticks its wing-claws in the ground, and crawls along like a bat. It has a well-shaped hind-foot, which is like the leg of a lizard.

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"It is all covered over, tail and back, with scales (4) that are wide apart. They do not overlap. It is of a slate-color. The scales are nearly white, and almost square, — a little longer one way than the other. It is about as large as a bald-headed eagle. They look like great bats flying around (5). (Draws Fig. 68.)

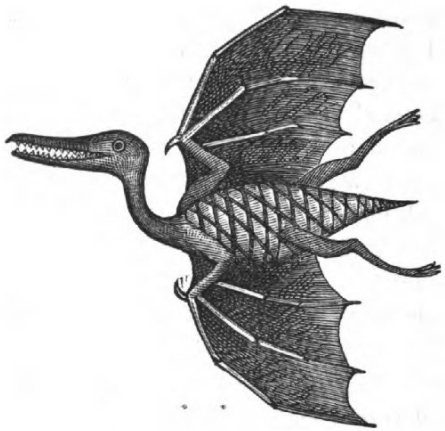


FIG. 68. — Bat-winged pterodactyl.

"They seem like regular devils, going round eating every thing, — not only eggs, but young ones. They dare not attack the large ones. The poor frogs have to catch it! They are large and conspicuous." ("How large?") "About eight inches long. They get on the rocks in the river, and the pterodactyls go for them. They dive into the water, and the leaping reptiles seize them. These kangaroo-reptiles are very active. I see one scratching its head with its hind-leg.

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"There are several kinds of them. One has a beard round its jaw, of stiff, coarse hair, two or three inches long. It would prick your hand, it is so stiff.

"I see now the skeleton of a very long-necked animal, like a plesiosaurus, stretched on the sand. It is about twenty feet long. The head is lizard-like, with conical teeth. I see the paddles" (6).

(1.) As soon as the animal was drawn, I was struck with its resemblance to what Prof. Cope calls *Lælaps aquilunguis*, a large kangaroo-reptile found in the marl-pits of New Jersey, a restoration of which is contained in "The American Naturalist" for April, 1869. I do not think that Sherman had ever seen this; but I am not sure. There must have been a great resemblance between the *lælaps* of New Jersey and the kangaroo-reptile of the Connecticut valley. Of the New-Jersey reptile, Prof. Cope informs us that its bones are light and hollow; and that it probably walked on the entire sole of the foot, like a bear. The fore-limbs were not more than one-third the length of the hind-limbs, which could not have been less than six feet eight inches in length. "Fragments of the jaws indicate a face of very considerable length, showing shining, saw-edged, knife-shaped teeth." Prof. Cope says, we can "imagine our monster carrying his eighteen feet of length on a leap at least thirty feet through the air, with hind-feet ready to strike his prey with fatal grasp, and his enormous weight to press it to the earth." What is remarkable, he adds to the description of this and other allied forms the statement, that their existence

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"would amply account for the well-known foot-tracks of the triassic red sandstone of the Connecticut valley." *

The kangaroo-reptile was not, however, much more than one-third the size of the *lælaps*.

(2.) It was probably warm-blooded, and therefore much more active than our modern reptiles.

(3.) I have examined many of the tracks found in the valley of the Connecticut River, but have seen none that exactly correspond with those that would have been made by this animal. The tracks attributed by Dr. Hitchcock to *Anomœpus* approach nearest to it. Fig. 69, from "The Popular-Science

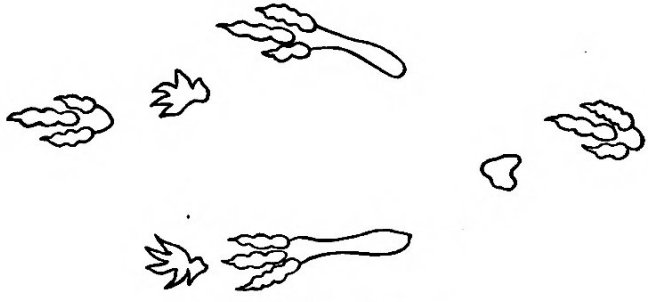


FIG. 69.—Tracks of Anomœpus.

Monthly," represents a portion of a slab, on which the track, exactly resembling that of a three-toed bird, suddenly changes, in consequence of the animal resting, to the track of a tailed quadruped; its long heel resting on the ground, and its tail making an impression.

* American Naturalist, vol. i. p. 23.

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I think it probable that the kangaroo-reptile walked at times upon its hind-feet, as well as hopped; though Sherman does not appear to have noticed it.

(4.) Cuvier taught that the pterodactyl had scales; and he was probably correct with regard to some species.

(5.) This pterodactyl differs from all that have hitherto been discovered, in having all the digits of the anterior limbs attached to the wings, as in bats, instead of merely the fifth digit, as may be seen in all previous representations of the pterodactyl. No tracks have yet been found in the Connecticut valley that indicate the existence of the pterodactyl at the time its sandstones were deposited: but we may confidently expect them to be discovered; for they appear to have been very numerous.

The oldest known remains of the pterodactyl are from the lower lias of Wurtemberg; and I think it will be found that the sandstones of the Connecticut valley are as young at least as this, the probability being that the upper beds are considerably younger.

Fig. 70 was sketched by Sherman some time after the examination, and gives, with very little change, the scene just as he observed it and was able to delineate it.

(6.) This he subsequently saw alive. The plesiosaurus has been found in beds which range from the lias to the chalk inclusive; and it is not, therefore, surprising that it should be in the Connecticut valley, if we consider the time to have been as recent as the lias.

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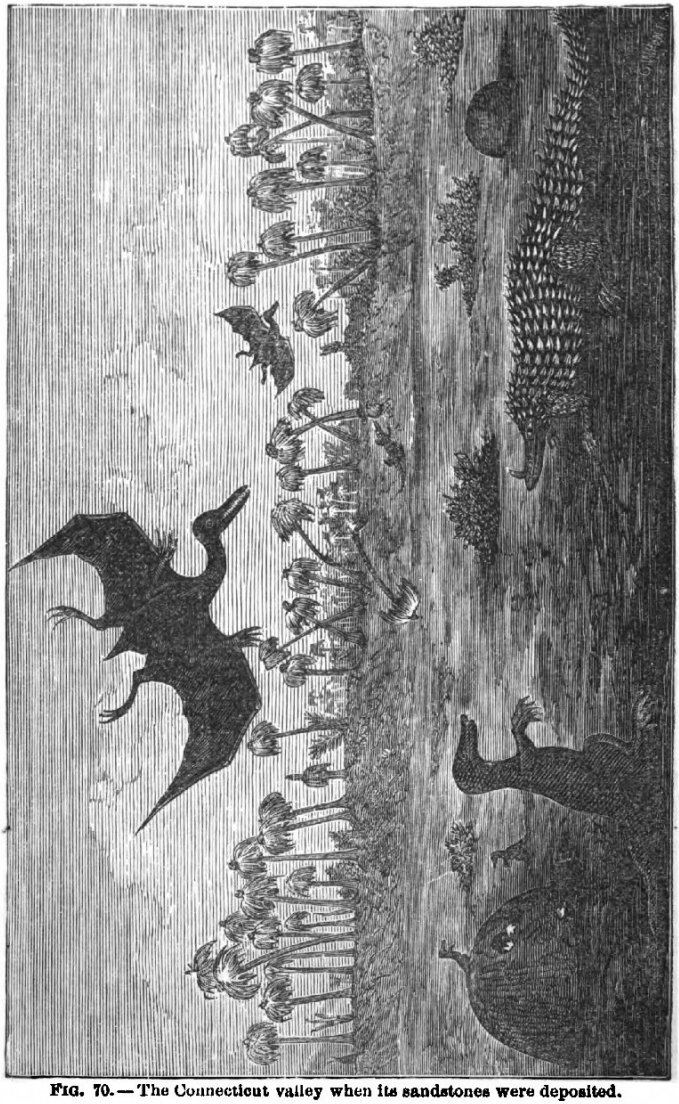


FIG. 70. — The Connecticut valley when its sandstones were deposited.

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PTERODACTYLS IN THE CONNECTICUT VALLEY.

On the following day the examination was continued.

"I seem to be in exactly the same place as before. I see a number of those nests, and as many as a dozen pterodactyls; some flying. Some are hanging on the bushes by their hooks. I fancy some are nocturnal (1). One has a spread of as much as four feet from tip to tip. I see some little ones almost exactly like a bat. Their jaws are short."

("How do they move?") "They stick their claws into the ground, and then move their hind-feet along (2). It is easy for them to hang, — no effort at all.

"The large ones fly after the little ones, and eat them.

"They are not mammals, as I supposed: they are reptiles; though some of them are quite hairy."

I asked him to find a nest, and describe their eggs; but he exclaimed, "Oh! I see a monstrous one now. It even attacks the kangaroo-reptiles, and takes them right up. Its body is seven feet long (3). When its wings are spread out, and I look at them edgewise, I see them get thinner as they go out from the body, till they look no thicker than a sheet of paper. In this one, the last finger, that should be the little finger, is long; and the wing extends from that like the pterodactyls of the books. This does not rest on the trees. It takes animals up, shakes them, and then comes down with them on the ground, and eats, holding them with the fingers of its fore-feet. It lights awkwardly, fluttering for some time.

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"The wings are very much hollowed when spread out like an eagle's wings.

"It goes round quite slowly after eating. It is too heavy to hang on a tree. I think it is preposterous to represent one of these catching a spindle (4).

"I see another kind of kangaroo-reptile, very much like the other; only its feet have long claws on like a bird's.

"It is difficult for the pterodactyl to rise. It is like a man on stilts who has fallen down. Its wings are so long, that it has to lift its fore-feet up a long way to get them clear of the ground. This large one is the terror of every thing. It goes down into the water, and can fly up from the water a great deal easier than from land. It can dive like a kingfisher. There are quite stout bristles on it, on the web between the fore-legs and shoulders, and across the back. Its neck is very long, like a crane's neck. It has no scales, nor have any that I have seen to-day."

THE HORNED REPTILE.

"I see some very large reptiles on a hill away off the river where the ground is bare. Their tails are immensely long. The reptiles are very sluggish. They have horns all over their body, and one on their nose (5). (See Fig. 70.)

"It is all sandy here; and it digs into the bank, and gets up bulbs that grow at the root of a palm-like tree. Some of them are three feet through: they are like the bulb at the root of an onion, and have roots extending from them in every direction. The reptiles root round, and kill many of the trees. They seem

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to be water-reptiles; but all I see are on land. (Draws the tree, Fig. 71.) It has a good many curls

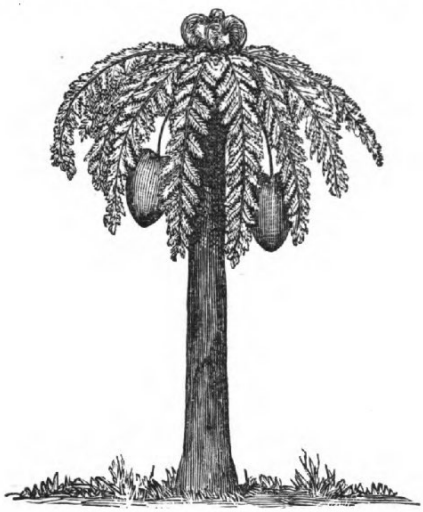


FIG. 71. — Bulbous-rooted tree.

on top, like a fern. There are some large fruits on the tree, nearly black. They look as if they were good to eat. I saw one that had been eaten into; and it was blood-red inside, like some peaches."

(1.) This he subsequently found to be the case. Cuvier supposed, from the magnitude of their eyes, that they were nocturnal; but it is probable that this was only the case with the smaller bat-winged pterodactyls.

(2.) Prof. Owen, from the anatomy of the pterodactyl, had come to the conclusion that it must have moved upon the ground in this way. He says, "The pelvis is weak, and the hind-limbs bespeak a creature

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unable to stand and walk like a bird. The body must have been dragged along the ground like that of a bat." *

(3.) The remains of pterodactyls have been found in the cretaceous rocks of England, which indicate an expanse of wing of not less than twenty-seven feet.

(4.) He refers to engravings of the pterodactyl, in which it is represented as chasing a dragon-fly.

(5.) This, in its general appearance, resembles the crocodile more nearly than any other existing reptile.

STRANGE REPTILES OF THE CONNECTICUT VALLEY.

A few days afterward, I powdered the last specimen, so that it might not be recognized; and this was examined as before.

"I am on the side of a river, — quite a large river. In it is a water-lizard about two feet long, smooth, and of a brown color. It has five toes on the fore-feet, and four on the hind-feet; and they are webbed (1).

"I see another of those large birds, exactly like the one I drew last Saturday. It is walking on the bank of the river. It is not like the place I saw before. There are no ponds here. (Made some slight changes in the figure of the bird previously drawn.)

"I see another pterodactyl, one of those big ones, flying round, and almost exactly what I saw before, — one of those bulb-eating reptiles at the root of one of those trees, — and a kangaroo-reptile jumping along.

"How those birds can run when they want to, and take long strides! The pterodactyls do not seem to trouble them.

* Owen's Paleontology, p. 272.

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"I see numbers of reptiles now, walking about on the muddy shore. I cannot understand why I did not see them before. Those bulb-eaters eat animals also: I see them eating young kangaroo-reptiles."

THE PENGUIN-REPTILE.

"I see a strange animal now. I think it must be a reptile. (Draws Fig. 72.) It is between two and



FIG. 72. — Penguin-reptile.

three feet tall. It has a smooth skin, and is nearly black. It has a penguin look. The fore-arms are flippers, such as a seal or a walrus has (2). The hind-feet are webbed, and have three toes. It has sharp teeth, like those of a pike. It walks on its hind-feet alone, very slowly; takes short steps; and is all the time assisted by its tail (3).

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"It is about as ravenous in the water as the pterodactyl is on land. It attacks fishes, frogs, and every thing it can. It swims strangely: it makes flippers, hind-feet, and tail, all go, but swims principally by its flippers.

"Here is a dead fish with a curious kind of fin right behind the gill.

"Now I see a kind of hump-backed animal, — a curious reptile, very large; I think, as much as thirty feet long. It is in the water, and is a good deal like an ichthyosaurus, but has feet instead of paddles. The teeth are large and conical; and the feet are like frog's feet. (Draws. Fig. 73.)

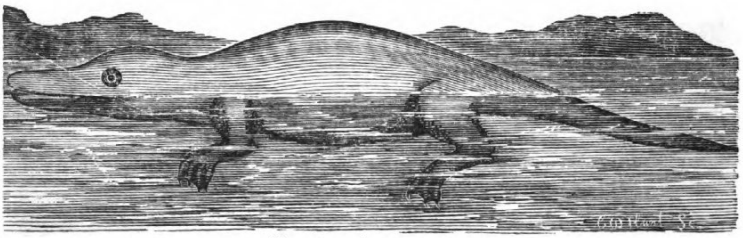


FIG. 73.— Great reptile.

"The penguin-reptile tries to bite it; but the skin is too tough for it to make an impression. It seems to care nothing about it.

"This great reptile actually catches the pterodactyls. It stays under water; and, when they come down to fish, it snaps them, and down they go. It turns them round to get them the right way to swallow.

"Here is a long-necked reptile too, like a plesiosaurus. (Draws Fig. 74.) It ate up a young one of these large reptiles.

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(1.) The *apatichnus* of Hitchcock is about such a track as this animal would have made, except that, in the track, there are no indications of a web.

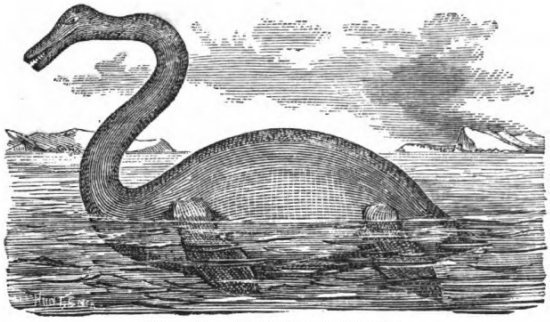


FIG. 74. — Swan-necked reptile.

(2.) In answer to questions at the close of the examination, he stated that there were inside of the flipper a number of bony rays, so that it resembled the fin of a fish more than the fore-limbs of a seal; and the animal seems to have been a compound of reptile, bird, and fish, — one of those comprehensive types of which we have so many examples among the old-life forms.

(3.) There are tracks on the Connecticut-valley sandstones that appear to have been made by somewhat similar forms, only much larger.

The number of animals intermediate in form between reptiles and birds must have been very great. Psychometers have certainly described to me more than twenty different kinds, forming steps in the ladder of life that connected these two, at present, widely-differing classes.

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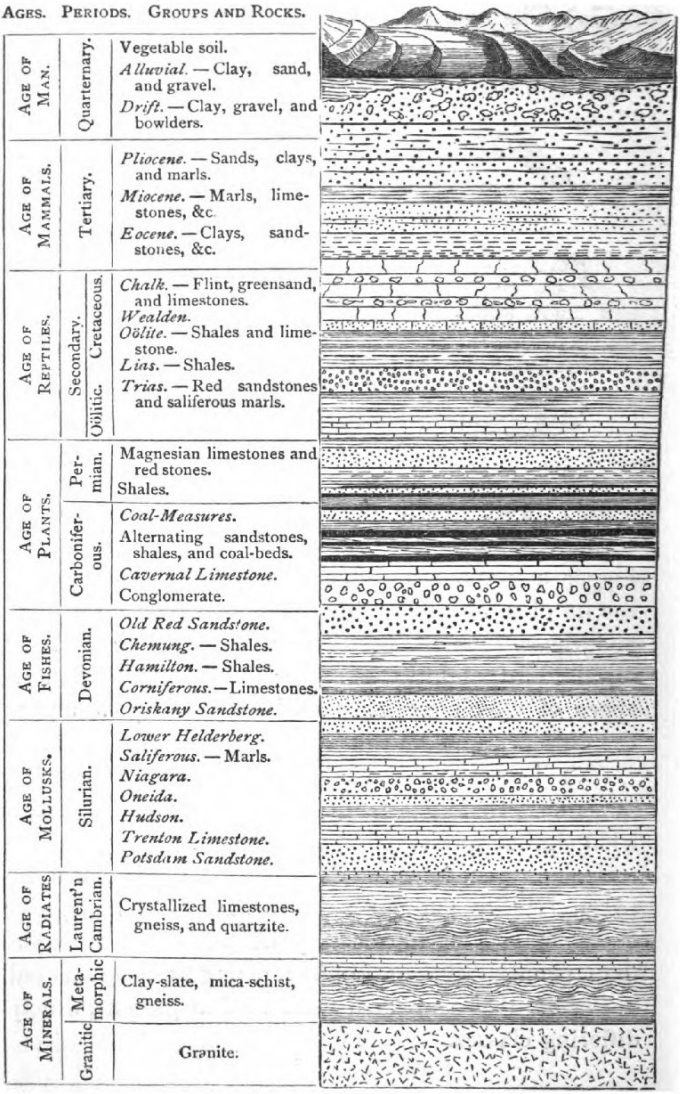


Fig. 75. — Chart of formations.

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A MAMMOTH FROG.

JULY 3, 1873.

Part of a large slab, powdered, from Smith's Ferry.

"This is, I think, something from the Connecticut valley; for I see some of the same kind of animals — kangaroo-reptiles and penguin-reptiles — along the side of the river; a very large pterodactyl too: I should think it is twenty-five feet from tip to tip. It is flying."

"I see one large animal that looks something like a frog, but is as large as a good-sized cow. (Draws Fig. 76.) It has webbed feet, and the web is very thick

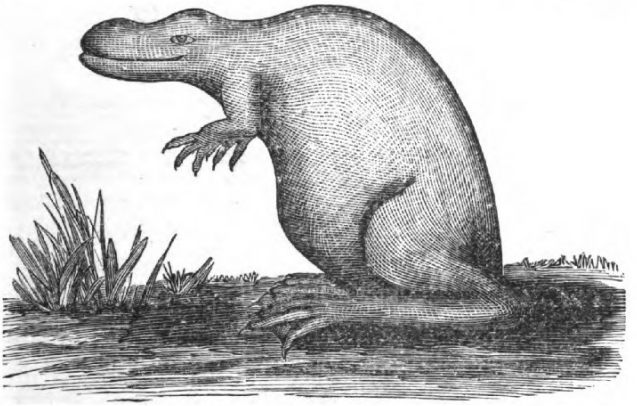


FIG. 76. — Mammoth frog.

and tough. It has five toes on the fore-feet, and four on the hind-feet. The hind-feet are very much larger than the fore-feet. The skin is bare, and spotted green and brown. It walks, and sometimes hops. Sometimes it walks on its hind-feet, and sometimes it uses all four (1). It has no tail. Its teeth are long and conical: they stand two inches above the gum.

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"When it comes down on its fore-feet, its belly makes a deep hollow in the mud, and you can see the foot-marks all round that.

"It leaps on reptiles larger than itself, and kills them. I saw it kill one of those bulb-eating reptiles. It plays with it after it is dead, somewhat as a cat does with a mouse, — lifts it up, shakes it some, and leaps upon it. I should like to see the slab with these tracks on: there are about forty or fifty all round here.

"A very large beetle is crawling around here. It is a carrion-beetle, and three or four inches long. (Draws

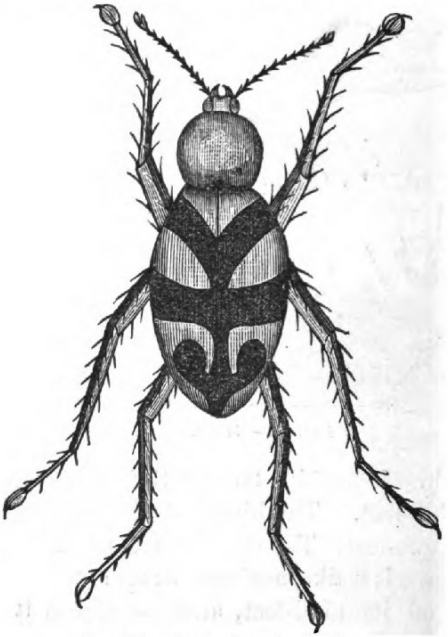


FIG. 77. — Ancient carrion-beetle.

Fig. 77.) It is red and black, — the same color as a carrion-beetle, but marked differently.

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"Oh! but I see some pretty butterflies by the side of a puddle near the river. They are quite small, — about two inches across, — but very beautiful." (Draws Fig. 78.)

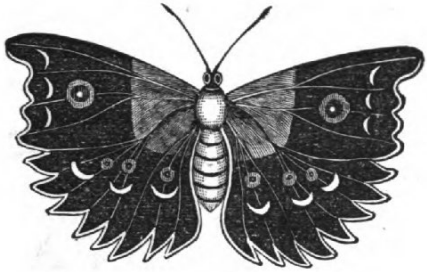


FIG. 78. — Crescent-winged butterfly.

("What color is it?") "The main portion is a dark blue; the central dot is white, the space round it nearly green; the rest of the wing a light blue, except the crescents, which are silver-white. The small wings are pink, with a white margin round both wings.

"The males are the most beautiful. In the female the colors are quite pale. They are about as hairy as moths.

"When that great frog jumps, it makes tracks a foot deep in places. No one would suppose them to be tracks. They fill up with water.

"I see another butterfly flying. It is all white but two large pink spots on each wing. Oh, I see! it is a moth.

"I see another of those large frogs: it is larger than the first. What a tremendous mouth it has! I can easily reach to the top of its head when it is sitting. The eyes are not very large for the size of the animal, and they are not on the top of the head.

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"I see a great many narrow-toed tracks, such as I saw last night, — one long middle toe, and two short ones; but I see no animal that makes them.

"Those small butterflies are very common: they are in swarms around the puddles.

"Oh! I see a very long-nosed, kangaroo-reptile. It has an extremely long nose. (Draws Fig. 79.) The

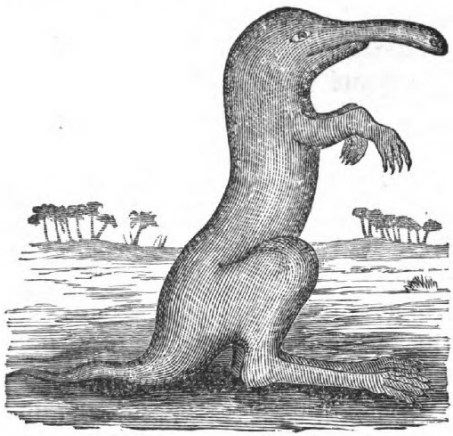


FIG. 79. — Long-nosed kangaroo-reptile.

under-jaw is not long at all. It is eating grass. It has five toes on the fore-feet, and four on the hind-feet. It has to bite at the grass sideways.

"When another one came up, it jumped at it, and struck it with the nose, which is quite hard, as a woodpecker does with its bill.

"While that one peacefully nibbles grass, I see another one eating some kind of large eggs, which it digs up with its nose and fore-feet. It draws the earth towards it. The eggs are very large, — as much as five

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inches through, — and clear and soft. There are a great many of them in a great heap of dirt. It punches them with its nose: they are tough. I see a small lizard in the middle, like a crocodile: it may be a young bulb-eater. Some of the eggs are so tough, it cannot get them open."

(1.) Tracks of what is believed to have been an enormous frog have been found in the Connecticut valley. The hind-feet were about twenty inches long, were webbed, and covered about a square foot of surface; but the track of the *otozoum*, as Hitchcock has named it, does not agree, except in the number of the toes, with the feet of the animal represented. It is probable that there were many huge batrachians, and reptiles between batrachians and lizards, in the Connecticut valley, at that time.

WALKING-FISH.

JULY 5, 1873.

Portion of a slab from Turner's Falls, Mass. Sherman knew that it was a Connecticut-valley specimen.

"I seem to be away from the river, on a bank; but I can see the river, and I see an elk." ("Go farther back.")

"I am in a different place, near the water; and I see a great many fish, none very large.

"I see as many as a thousand very small frogs, not an inch long, yellow and black. I think they are full-grown. They are all the same size and the same color. They are hopping round near the water. They have five toes on the fore feet, and four on the hind.

"I see a strange-looking animal. It has four small

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feet." ("What color is it?") "It is nearly black. The head looks considerably like a frog's. I fancy it has been injured. It seems to be a female. I see a male — jet-black, shiny-black — with the same kind of marks. The skin is bare. It has a very large mouth. (Draws Fig. 80.) The teeth seem as if they were made for

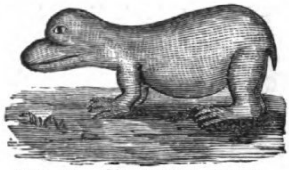


FIG. 80. — Short-tailed reptile.

crushing shells. The hind-feet are much longer than the fore-feet. (Draws Fig. 81.) That is the track.

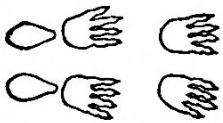


FIG. 81. — Track of short-tailed reptile.

"It is a plant-eater. It feeds on the tender curls of the ferns. It is about as large as a rat, and has an ear just like a frog's ear, — a little brown spot." ("Is it a mammal?") "I do not think it is: it has no teats.

"Well, here are some curious tracks; made by a

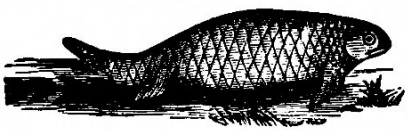


FIG. 82. — Walking-fish.

walking-fish, I should think. I see the fish making them. I will draw the tracks. (Draws Fig. 82.)

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They are made by the fins. It is very scaly, and about a foot long. The fins are notched. It is as much as fifty feet from the water, and walks as fast as a turtle of the same size (1).

"I see kangaroo-reptiles and bulb-eaters.

"It can only move the fore-fins: the hind ones are stiff, and don't touch the ground. Its belly drags along. It goes into the river, and then comes out again, and into puddles. It does not like to stay out long. When its back gets dry, it goes into the water again.

"I see as many as five hundred in one place, travelling about. Some lose their balance and fall over, but get up again. When they put down their fins to push, it lifts them up, and they look a little like toads hopping. It is of a brownish color; but there is a kind of metallic blue when the light shines on it in a certain way.

"Now I see a very curious track made by a crustacean. (There are a great many small animals.) This is five or six inches long. The marks are made by the claws. (Draws Fig. 83.) It is of a slaty color. Its

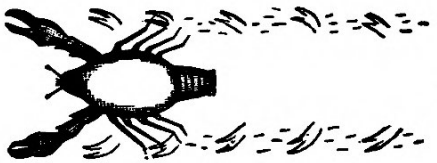


FIG. 83. — Crustacean and track.

tail is so small, that it does not drag at all. It walks a good deal like a beetle (2).

"I see a butterfly, that looks, on the edge of the wing, like the outline of a man's face. It is about six inches

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across. (Draws Fig. 84.) It is pink, black, and a very little red on top, and dark underneath. There

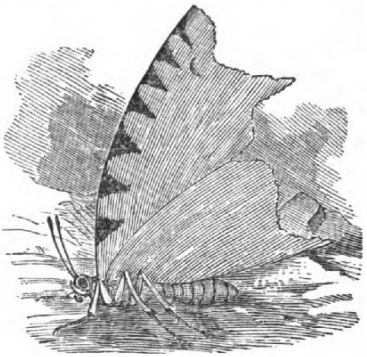


FIG. 84. — Profile-butterfly.

is a spot that answers for an eye. Where it is black on the under side, it is red on the upper.

"A very long-legged insect is laying its eggs here. It looks like a crane-fly, and is about six inches long. It is a great daddy-long-legs. Its track is very fine.

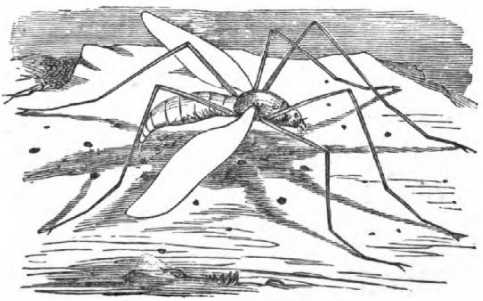


FIG. 85. — Ancient crane-fly.

It keeps bobbing down, punching holes in the mud, and laying its eggs" (3). (Draws Fig. 85.)

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(1.) Living fishes of the families Lophiodæ and Siluridæ have the ability to travel on land. Dr. Hancock, speaking of the *flat-head hassar*, says, "It possesses the singular property of deserting the water, and travelling overland. . . . When the water is leaving the pool in which they commonly reside, . . . they simultaneously quit the place, and march overland in search of water, travelling for a whole night, as is asserted by the Indians, in search of their object. . . . They project themselves forward on their bony arms by the elastic spring of the tail exerted sideways. Their progress is nearly as fast as a man will leisurely walk." *

Dr. Hitchcock regards some of the tracks on the Connecticut-valley sandstones as the tracks of fishes; but there are none of them that resemble those of Fig. 82.

(2.) The tracks represented by Fig. 83 very much resemble those on a sandstone slab found at Turner's Falls, and figured on Plate 51, Fig. 4, in the "Ichnology of Massachusetts," by Dr. Hitchcock, and are represented by him as the tracks of a crustacean.

How a crustacean like this could make such tracks, it is difficult to see. It would appear that the large claws were stuck in the mud, and the body pulled along; while the smaller feet moved lightly on the surface, leaving but little evidence of their existence.

(3.) It seems to have resembled our common daddy-long-legs both in appearance and habits.

* Penny Cyclopædia, art. "Siluridæ."

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MORE STRANGE ANIMALS.

JULY 8, 1873.

Specimen from near Smith's Ferry.

"I see a large bird like the last I drew, but smaller. It is, perhaps, a young one. It is walking along on the mud near the river. There is a strip here, only about two hundred feet broad, that is covered with mud.

"It is a very dark, cloudy day. I see many of those bulbous-rooted trees, with fruit on them. This bird goes along like a great Shanghai, digging into the mud with its bill." (Turned the specimen over.)

"I see a pair now in the same place, and of the same size. This may be a smaller species. These birds are troubled with a large kind of lice: I see them on their feathers. (Draws Fig. 86.) They are



FIG. 86.—Flying bird-louse.

very flat, of a yellow color, and about as large as my thumb-nail. They have the most singular legs I ever saw; and they have wings (1). When the bird shakes itself, they fly off; but, just as soon as it is still, fly back again, and run under the feathers.

"I see a kind of beetle on the mud, with a very long proboscis, with pincers on the end of it. (Draws

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Fig. 87.) It is about an inch long; perhaps a little more. It is a shiny black.



Fig. 87.— Proboscis-beetle.

"I think it would puzzle any one to tell what made these tracks. (Draws Fig. 88.) It is a worm with



Fig. 88.— Spiny-tailed worm.

a spiny sort of tail. It is about two inches long, and of a green color. Underneath it has rows of ridges, two to each joint; except the first, which has three.

"A dead dragon-fly is spread out on the mud. It is six inches across. It looks as if it would fossilize nicely. The body and head are green, and the wings transparent.

"They have big showers here. There is one now that seems as if it would wash every thing away. This muddy place seems to get larger every rain. There is a bank of earth, back from here, that washes down where the river rises, and increases the flat.

"The birds make for the bank when the shower comes. How they straddle!

"Well, I declare! I see a mammal that looks very

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much like a rat. It is hairy; has a long, file-like tail, and sharp front-teeth, like a rodent." ("Is it marsupial?") "No. It makes rather curious tracks, — roundish marks, not a bit like its foot (2). (Draws Fig. 89.) It is about the same size as a good-sized

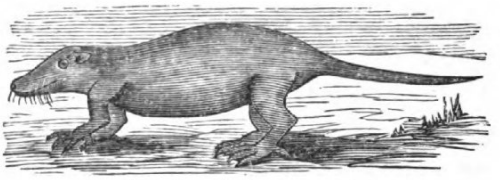


FIG. 89. — Ancient mammal.

rat, and the same color; and has five toes on each foot.

"I see a strange head of some animal. The mouth is all covered with perfectly flat teeth, — tongue and all. The head is a foot long, and the mouth is wide open. It must be some large fish.

"There is a very small and long snake — about eighteen inches long — on the mud. It is no larger round than my little finger at the end. It is dark-colored, with black spots."

(1.) The legs are much like those of some modern bird-lice; but these ancient parasites differed, it appears, from all the modern ones, in their possession of wings.

(2.) There are tracks on the Connecticut sandstones something like those he drew, and supposed by Dr. Hitchcock to have been made by some mammal. The remains of marsupial mammals have been found as low as the trias; and it is not unlikely that there should have been, at this period, mammals still higher in the scale.

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THE TRACKS OF A PTERODACTYL.

AUG. 7, 1873.

"I think I am somewhere in the Connecticut valley; for I see one of those large birds I drew last.

"I see about as curious a track as I ever saw. It is, perhaps, six inches long. It is uneven (1). (Draws Fig. 90.) They go in pairs, a good distance apart.



FIG. 90.— Curious track.

"I think this animal would be difficult to restore, from its track. It is, I think, a little pterodactyl, that struck its wings when it went to rise, and made these impressions (2). (Draws Fig. 91.) The longest tracks would measure about a foot.

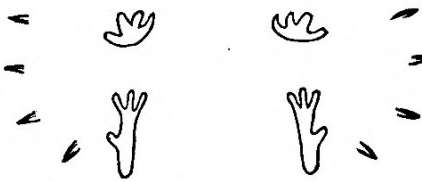


FIG. 91.— Supposed track of a pterodactyl.

"There are some trees on this level place by the side of the river that are different from what I have seen before. (Draws Fig. 92.) Some of the leaves are crooked. It is only about ten feet high. I see a handsome little butterfly about two inches across. The upper wings are yellow, edged with dark brown;

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and the lower wings are yellow, with silver crescents." (Draws Fig. 93.)

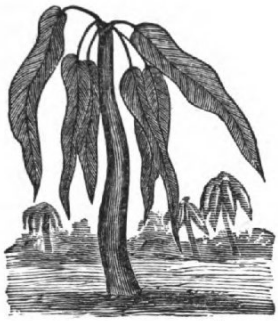


FIG. 92. — Crooked-leafed tree.

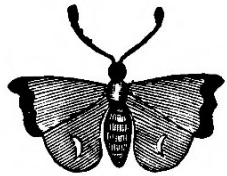


FIG. 93. — Handsome little butterfly.

("Go down the river.") "I think there are just as curious animals away from the water; only they did not make tracks. I see some. (Draws Fig. 94.) It is

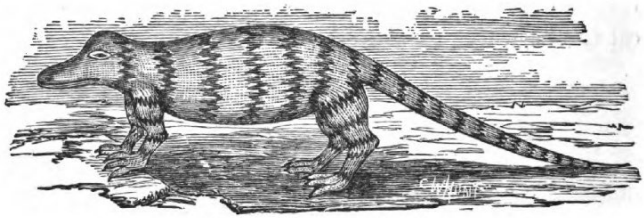


FIG. 64. — The Banded reptile.

a sleepy-looking animal, about as large as a cat. It is singular, that, except butterflies, nearly all those ancient animals are deficient in color. This is better than some. It has brown zigzag marks; and the rest is a dirty white. It goes by jumps. The skin is quite smooth. It burrows in the ground. There are several pterodactyls here. They go in company like many birds.

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"I see a strange thing now. I do not know what to call it. (Draws Fig. 95.) It blows up, and then

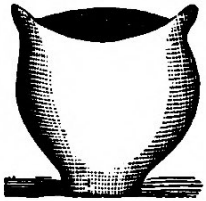


FIG. 95. — Puff tube contracted.

sinks down, about every three seconds, regularly. It has a little hole at the top; and I can just see something fine coming out. When it is puffed up, it is black at the top, on the outside, and the rest brown; but, when it sinks, the black part is the inside of the cup. When it rises to the top, it gives a gentle puff. I see some others round here doing the same thing. There are some old, dead ones. All that grow round here keep time. When one is up, they are all up.

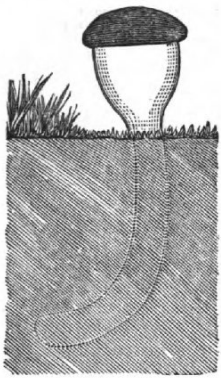


FIG. 96. — Puff tube expanded.

"Now I see one pulled up that is not going. (Draws

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Fig. 96.) It has not roots: there is only a black tube. It is just a hollow shell, with no hole at the end that is in the ground.

"There is something inside that moves as the outside moves. It is filled with some kind of substance."

(In answer to questions.) "It is about four inches high. The shell is hard as a snail's; but the top is like thin rubber.

"I think it is an animal. I see one that is a cup at the top, and has something on top that it seems to be taking in. The hole enlarges, so that it goes in."

(In answer to questions.) "It is mountainous round here, and mostly covered with ferns and large-leaved trees such as I just drew."

A METEORIC SHOWER.

"I see a great meteoric shower in the day-time. The stones strike the trees. One set the grass on fire when it fell: sparks flew off in every direction. The meteors are coming down very fast. I do not hear many explosions. They come down obliquely, and from the south. I see a magnificent one that must weigh more than a ton. The hot air from it scorches the leaves over it. As the lower leaves fall, the upper ones are scorched, and droop. This large meteor rolled along the ground when it fell. They are falling now as thick as sparks from a Roman candle when it bursts. I saw one, as large as a man's head, strike on the side of a hill, and go out of sight.

"Some of them were so hot, they flattened out when they fell" (3).

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(1.) This is different from any thing that I have seen from the Connecticut valley. It appears to me to indicate a bird-like reptile, whose general mode of progression was by hopping.

(2.) It is difficult to see how any pterodactyl with which we are acquainted could make such wing impressions as those.

(3.) It is quite probable that meteoric showers were much more common in the world's younger days. The iron, of which they are mostly composed, would oxidize after reaching the earth; so that we have but little chance to find these ancient meteorites.

A NIGHT-VISIT TO THE CONNECTICUT VALLEY IN THE LONG-AGO.

AUG. 12, 1873.

The examination was continued on the next day.

"I hardly know where I am. It is night, and this is a strange-looking place. The moon is just rising over some mountains about ten miles off, I think." ("Are they high?") "Yes: quite high. It is a hideous place at night. The noises are horrible. I hear what sounds like a bull-frog's croak magnified a thousand times. I see one of those dodo-like birds that I saw last night (1). (The moon is nearly full.) It is walking along on the side of a stream.

"I see a quite handsome flower: I think it must bloom in the night. (Draws Fig. 97.) There are bunches of them on what look like flags. I think the flower must be blue. The plant is about six feet high.

"There are a great many insects, for I hear them

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buzzing and humming; some of them beetles, by the sound.



FIG. 97. — Night-blooming flower.

"I see a very curious phosphorescent worm, or glow-worm. (Draws Fig. 98.) It is about two inches

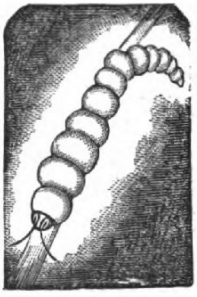


FIG. 98. — Ancient glow-worm.

long. It is head downward on a stalk of that plant. The light radiates from the back, so that you can see the whole body (2). The light makes the worm look green. It seems to come from the inside; so that you can see into it.

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"Small pterodactyls of the bat-wing kind are flying about (3).

"It is the kangaroo-reptile that makes such a terrible noise." ("Which kind?") "The first kind: the others, I think, are rare.

"I see a large kind of fire-fly. The shape is about all that I can see. It seems to be of quite a different kind from our fire-fly (4). (Draws Fig. 99.) It lifts

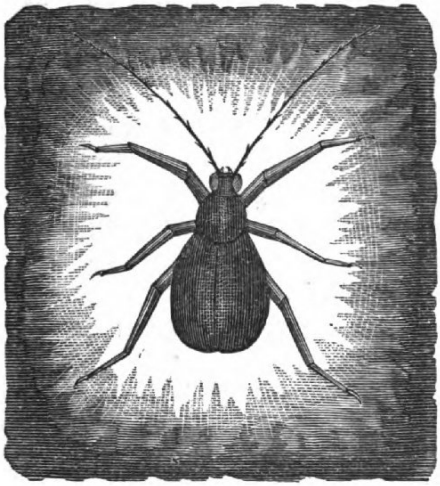


FIG. 99. — Luminous beetle.

its wings when it is giving the light. It seems to come from the back. It is not luminous when it is flying.

"There seem to be about as many animals in motion by night as by day. Three long, slim snakes are crawling along on this flat by the river.

"There is a very bright star just above the moon:

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it seems to be white. I do not think I ever saw it before. It is much brighter than any star we have now. It gives so much light, that every thing has a double shadow (5).

"I see another shower of shooting-stars a great way off. I think they must have been common then. They are pouring down; and all seem to come from one place, and not from a very great height.

"Now it is day, and I am in a different place. I see where lava has run down, and made a place like the Giants' Causeway (6). The river runs close to the columns."

(1.) In an examination which is unrecorded.

(2.) Although the light of the glow-worm proceeds from the under-side of the abdomen, it is so vivid as to shine through at the junction of the segments on the back. Two species of centipedes give light, at night, from the whole body.

(3.) This smaller species of pterodactyl may have fed upon insects.

(4.) At least seventy species of luminous beetles are known which are natives of the hot and temperate regions of America.*

(5.) This may have been a comet, or a star, such as have been known to blaze up for a time with great brilliancy.

(6.) There are bodies of trap in the Connecticut valley, to-day, that have a columnar structure; and many may have existed, and the action of the river swept them away.

* Kirby and Spence's Entomology, p. 506.

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COAST OF THE UNITED STATES WHEN THE SANDSTONES OF THE CONNECTICUT VALLEY WERE FORMED.

A few days after the last examination, Sherman made another with the powdered specimen from Smith's Ferry; when I said, "Go down the river." After a description of the country and some of its animals and plants, which I should give if I could afford more space to these examinations, he said, "I have come to a place where there are falls, about ten miles below. There are rocks on each side, eight or ten feet high, that the river has cut through.

"I have come to the sea now. There is a large bay before I come to the open sea. It is quite inland; but the water is salt." He then drew a sketch of the river, bay, and coast; but, finding the book too small to continue on the scale with which he commenced, he drew a second on a large sheet of paper. The following (Fig. 100) was carefully drawn from these two, giving as accurately as possible the outlines drawn by him.

Although he knew nothing of the disposition of the rocks in the United States called the new red sandstone, and could not possibly have known any thing of the geography of the country at the time the rocks were laid down, yet it will be seen, by those familiar with the subject, that the map, although rude, indicates a familiarity with the then-existing coast. What is now the coast of New Jersey is represented as stretching much farther into the Atlantic Ocean; and I find, although I did not know it at the time, that this had been previously conjectured by those familiar with the geology

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of the region. Dana says, referring to this locality,

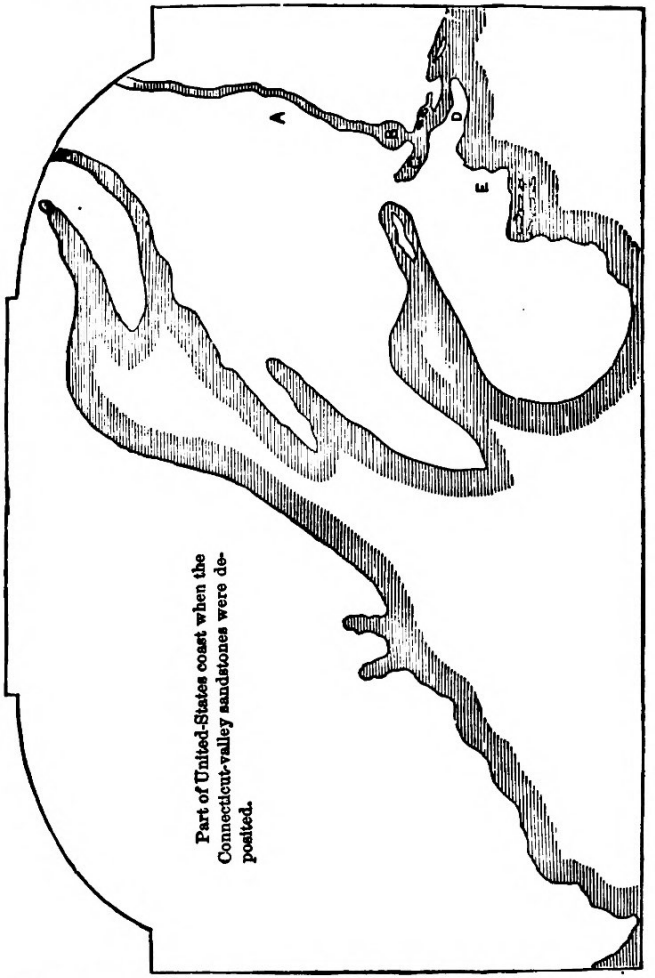


FIG. 100. — A, Connecticut River. B, "the Bay." C, Gulf where Long-Island Sound is. D, Land where Long Island now is. E, New Jersey.

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"The strange absence of Atlantic seashore deposits in the triassic period may be accounted for by supposing that the dry land stretched farther out to the eastward, and that the seashore deposits were formed, but are now submerged." * The first gulf represented to the west occupies about the place now occupied by what is called the palisade range of the new red sandstone, which is about three hundred and fifty miles long, and from five to thirty miles broad: so we know that there must have been a gulf at that time as large as this, where the sandstones were deposited. The most western gulf represented on the map, into which flows a large river, is partially represented to-day by ranges of red sandstone in North Carolina.

BIRD-REPTILES OF LEBANON.

JUNE 25, 1873.

With a piece of cream-colored limestone from Mt. Lebanon, probably of cretaceous age, Sherman saw the following: —

"I seem to be a long way back in time. A large rock goes out into the water, sea or lake; and on that are a number of bird-like reptiles. (The water is very still: it is fresh.) They are as large as a turkey, and dark colored. They have no wings; but their short fore-feet seem to be about half-wings. Sometimes they hop like kangaroos, putting their fore-feet down; but generally they walk on their hind-feet alone. They have three toes on the hind-feet, and four on the fore-feet: they are all joined by a web, except the

* Dana's Manual of Geology, p. 440.

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tips; and there are claws on both feet. Their bodies are thickly covered with stout bristles. The skin is black, and the bristles not so dark. They have no teeth, but a bill like a bird (1). (See Fig. 101.)

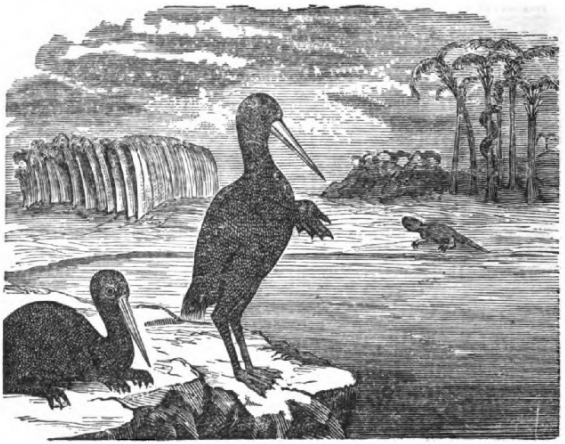


FIG. 101. — Bird-reptiles of Lebanon.

"Now I see some curious reptiles with small bodies and enormous heads. They are about seven feet long, and of a dirty color; and, like the frog,

'For convenience' sake they wear
Their eyes on the top of their heads.'

They have a bunch of stout bristles under the throat, — a kind of beard. (Draws Fig. 102.)

"They are good swimmers. There is no web uniting the toes; but each toe has a web like a dabchick's.

"They seem to be friendly with the bird-reptiles.

"The young bird-reptiles look very odd, quite white, and like a chicken with its feathers picked off. The fore-feet look like a wing when it is picked, or a turtle's

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flipper, though it often walks with them. They are very playful. They jump, and enjoy life.

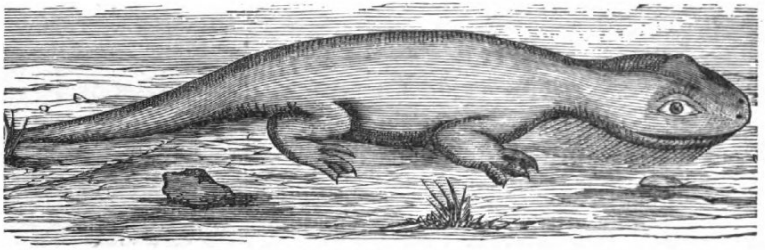


FIG. 102.—Bearded reptile.

"I see some just coming from eggs laid in the stump of a tree where the wood is rotten. The nest is nothing but small fragments of rotten wood."

("Have the eggs a hard shell?") "Yes: they are hard, and slightly buff-colored, four or five inches long the longest way, and the same shape at both ends.

"I see quite a large snake, some kind of a tree-snake, fifteen feet long, and very thick for its length; about six inches in diameter. The tail is very short." (Draws Fig. 103.)

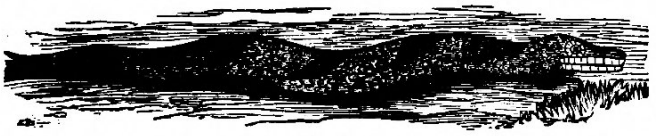


FIG. 103.—Short-bodied snake.

("What is the vegetation like?") "Ferns and palms,—tropical plants. I see one strange-looking tree. (See Fig. 101.) Those long ones are blossoms, I think: yes, they are.

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"I see a curious leaf, twenty feet high, and three feet broad, thin as paper, and all cut into slips at the end. It is ribbed, and is some kind of grass. (See Fig. 101.)

"The root is as thin as the plant, and keeps getting narrower. I see a kind of marsh, where there is a field of this broad grass for three or four miles. They do not grow in disorder, but one behind another."

(1.) Another of those linking forms, between the reptile and the bird, which abounded during the jurassic and cretaceous periods. The bill and body are very bird-like; and one might fancy those "stout bristles" to be incipient feathers. There were, however, I think, true birds long before that time, supposing the time to be as recent as the cretaceous.

THE ZEUGLODON.

Several years ago, Dr. Koch of St. Louis, having read the first volume of "The Soul of Things," sent me some small fragments of bone, which he was desirous that Mrs. Denton should psychometrize. He made no statement then regarding them; but, after I had sent him the following, he informed me that they were portions of the skeleton of the zeuglodon found in the eocene-beds of Alabama.

"I realize the immense period of time since this age: it is awful. What a mere speck of time our life is!

"I see the open mouth of a very large animal: it is before me, and I cannot see beyond it. The jaws are large, and furnished with teeth that are quite long. The whole framework seems strong. It resembles a

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serpent somewhat, but more an alligator or a crocodile. I cannot see the whole; but it is of monstrous size. I do not think it can be as long as it seems to be (1). It swims, and lives on fish (2). What a monstrous creature! It has a ferocious look. It seems as if it never would be satisfied. I cannot imagine what it is.

"Now I have a side-view of the head. I never saw any thing so formed for strength before.

"I cannot see the eye; only the socket. The bony ridge above the eye is large and rounded, and bevels inward to a hole about three inches in diameter, and then expands again. It is not very quick: there is no necessity; for it can master all it comes in contact with. I do not see the outside of it; but I get the influence of a thick, tough skin, covered with crusty, scale-like plates."

(1.) When full grown, the zeuglodon is supposed to have been about seventy feet in length.

(2.) Owen calls the zeuglodon a carnivorous whale. Prof. Winchell, who critically examined its skeleton, calls it an alligator-like whale. It lived on fish, without doubt.

SOUTHERN MASSACHUSETTS IN TERTIARY TIMES.

In the southern part of Marshfield, in this State, is a bed of marl, or green-sand, very similar to that of New Jersey, and probably of miocene age. I gave to Sherman a fossil bivalve from this bed; and the following describes what he saw: —

"It is a very dusky day. I see a lake, and a forest all around it. The water is very warm. It seems as

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if there must be a boiling spring in it. I see a great many lizards and shells; but they are small. Some shells on the muddy bank near the lake are large. The forest is, I think, pine, poplar, and fir. The water in the lake is salt (1). I don't see what makes it so warm.

"I see a small elephant (2) on the land. There is something the matter with its hind-leg: something has torn a piece out of it. It makes a terrible noise, and hits every thing with its trunk that it comes to.

"I see a strange animal in a tree. It is a quadruped with a very large head and mouth, and small body. It is covered with black hair. It has two membranes covered with hair, like the wings of a flying-squirrel, that come over the front: they are fastened on the back; and it opens and shuts them. It is pretty dark now; and, when it opens them, a light shines on the leaves like a lantern. I can see it a long way off. There are others. It lives on insects that see the light and come to it; when it catches them. It lives on beetles. The membranes were not folded up, but, when stretched back, gradually contracted into two slits, — one on each side of the back. It has a soft mouth. The teeth are not much harder than nails. It moves its head slowly from side to side. It is brighter near the throat than it is below. It is as bright under the throat as the kerosene-lamp. When the wings are folded back, and it is all open, there is no light at all. It grows fainter as it puts it back; and, when it is all open, there is no light at all. It is brightest when nearest together. Some are black, and others brownish.

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The black ones give the best light. The light seems to come from the inside of the membrane.

"The animal's body is as large as that of a big cat. I see a good many of them all around. There are millers and mosquitoes here; but it does not care for them. It has so large a mouth, that the bugs cannot escape. We need it now. It is a slow kind of animal. It rolls itself up in the daytime like a duck-billed platypus.

"When feeding, it stands on the two hind-legs; and the wings come over the fore-legs.

"I should think those animals would soon destroy all the insects, there are so many of them. I saw one put out its light. Their wings look something like red rubber stretched. When they come together, they fold up nicely. All these animals have nests. I do not think they go off their trees. On every tree where I see one, I see a nest. It is built on a branch, and they go in at the side. It has a cover to it. When these animals go to sleep, they make a noise like young chickens, 'Peep, peep,' but faint. They make the noise with the nose by breathing through it."

(1.) He calls it a lake; but it was probably a bay, nearly land-locked.

(2.) Geologists first become acquainted with members of the elephant family in the miocene period.

Mrs. Denton, on one occasion, saw an animal very much like this luminous beetle-devourer. It differed widely from every existing mammal; but hosts of strange living forms have gone, leaving faint indications to ordinary eyes that they ever had a being.

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PEBBLE FROM CAIRO, EGYPT.

JAN. 21, 1870.

Examined by Sherman.

"I am near the sea, on the beach. I see lots of animals like lobsters; only they have coiled tails, and round. I can see a great many fishes; and these animals catch them with their claws. They go along by moving their tails.

"Back of here it is level land: there is not a hump two feet high. It is nearly all woods.

"There are a great many wild animals round here. Tigers lie upon rocks like cats, and purr. They wet their paws, and wash their faces, like cats. One is watching a bird, and is crawling down the rock so as to get to the back of it. How softly it goes! It has seized it. It is about as large as a partridge. It has carried it on the rock, and is tearing it to pieces."

("Can you see yourself there?") "Of course I can; as plain as I can with my eyes. My hands look cleaner than they are now. (He means cleaner than the hands of his body, which were somewhat dirty at the time.) I can feel them too. I can see the place on the nail where it got caught in the wheel of the fanning-mill. I can see my feet; but there are no boots on. I am not clothed anywhere. I am not *now*. But it is like feeling two things at the same time. I am here, and feel my clothes; and then I am there, and don't feel them (1).

"It is licking its face. It has got through eating. I see some little furry animals in the trees looking down on this tiger." ("See if you can tell what

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country it is.") "It is near where Europe and Asia join together."

(1.) The sensations of all psychometers that I have tried indicate that the past has an actual spiritual existence; and nearly all of them have the sense of being present in that past, and they are able to realize it by all their senses as they realize by their physical senses the present. The spirit of the psychometer who goes back to this past resembles the man in the body, as he is generally recognized, in many respects; possesses all the organs apparently, and all the senses; feels its individuality so strongly, that it calls itself "I;" and recognizes that past so really, that it speaks of it generally as present. In some respects it differs, however, considerably. It can move by will more rapidly than light, and seems to be superior at will to all influences. It can feel the oppression of the heated air of the summer's day of a million years ago; but can plunge into the crater's open, fiery mouth, roam round in its glowing caverns, and come out unscathed. The cool breath of the evening is felt on the brow; but it can move without a shiver through the frigid regions of space that are more than two hundred degrees below zero. At will, too, the spirit can clothe itself in such habiliments as it desires, and obtain objects of various kinds by merely desiring their presence. And I think these experiences of the psychometer reveal to us in some respects the powers of the spirit when death releases us from the body, and ushers us into that realm where is to be found the real and the abiding.

Watching a psychometer when examining, one might suppose him to be in a perfectly normal state, with the

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eyes closed; but this is not the case. All the senses at such a time are quickened: sounds and smells that would be unnoticed at other times become exceedingly unpleasant to bear, and sometimes destroy entirely the ability to delineate. The psychometer, as I think, passes very rapidly from the normal to the abnormal condition, — so rapidly, that, as Sherman remarked, it was "like feeling two things at the same time;" that is, he felt in the abnormal state, then passed to the normal state, and felt; and the time was so short, that he did not realize its passage. When it is done more slowly, he is in one condition, and feels them; and then in the other condition, and does not feel them.

It will be noticed that the psychometer frequently changes the tense from past to present as he passes from his abnormal to his normal condition; and, in like manner, he sometimes speaks during an examination as if in a distant locality, and then as if present at the place of examination. I have preferred to retain these peculiarities, so that the reader might be better able to judge of the actual feeling of the psychometer during the examinations.

GLACIAL PHENOMENA OF THE DRIFT PERIOD.

In the first volume of "The Soul of Things" I have inserted some examinations in which phenomena of the glacial period — that most remarkable time in the world's history — are described. The psychometer, in those cases, was, of course, somewhat familiar with the time by previous reading; but, in the three following examinations by a boy of nine or ten years of age, we have descriptions — and, I think, very vivid and accu-

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rate ones — by one who had not read a line upon the subject, and whose knowledge of it now consists almost entirely of what he has been able to observe psychometrically.

The first examination in which the drift phenomena appeared was made in March, 1866. The specimen was a clay-stone nodule from drift-clay near Ottawa, Canada. Nothing was known by him regarding the specimen.

"I see a large bowlder rolling down a steep place into the sea.

"Oh! right up in front of me is great ice, as thick as thick can be. It is moving. It shoves the bowlders along. That must be where the bowlder came from. It sounds as a sleigh does when going on bare ground. The bowlders scratch so, it makes the cold chills run over me. There is a crack in the ice; and I can look down and see the stones scratching each other. It is sliding fast down toward the sea, — faster than I can run (1). When it went in, it sank away down, and came up all in pieces.

"I am up now. I can see the ice for a great distance, and the cracks in it. How they shine in the sun! I can see the colors of the rainbow in many places. There is one place where the stones have all been ground into mud. The mud is coming out from under the ice in a stream. There are bowlders on top of the ice: it is covered with little ones. There is one monstrous bowlder nearly as big as this room.

"I am on shore now; and I can look out on the ocean, and see a great many islands of ice. How they glisten in the sun! One dashed against another then, and cracked a piece off one side. It seems warm. I

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see the air rising from the ice like steam. In some places it is soft on top. One island came by then, very large and peaked.

"There is a peninsula running out into the ocean. One of the icebergs went against it, and some of the rock flew up on the iceberg: it hit it such a blow! There is an animal on that peninsula that looks like a bear.

"I find places back from the sea where there is no ice at all; and it seems pleasant as can be. There are trees; some of them near the ice. One touches it on one side. The tree is very tall; but the ice is four times as thick. I saw an icicle drop off at the top, and stick in the ground. It was by the tree, and broke off some of the branches.

"That is the strangest thing I ever saw. I was down on the side of the ice, and a piece of ice slid over, and made it all dark. It is cold down there now. It bent the great tree over, just like bending a twig. The bark slid off, the tree squeaked, and away it went." ("See where the ice comes from.") "It goes as far back as I can see for the horizon. I cannot see any place where it comes from. It is nearly all ice. Back from the sea, the air is pretty cool. It is sliding on everywhere; and I can hear the little stones grind underneath. The sea is thick with ice now. One could travel on it a long way. (When I first took it in my hand, I heard the stones grating before I put it to my head.) The country is all covered, all white; and the stones look like black specks in the distance.

"That peninsula has not been touched yet, only by

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the iceberg that struck it. There are many trees on it, but most on the isthmus that joins it to the mainland. One is coming down to it now. It goes pretty slowly through those trees. I can hear them squeak under the ice. It is over the isthmus now, and on to the peninsula. It has gone to one side. How horrid the place looks now, all covered with mud and fine ice, and the trees just rising up a little! It is all torn and tattered. There are places where the ice has gouged it out, and the water is springing up; and other places where it has left great heaps of gravel and bowlders. It was done in ten minutes. Those trees look dreadful. Their little heads are just sticking out of the mud, and are all covered with it. One tree on the end of the peninsula has not been touched yet. When the ice went into the sea, the waves dashed up very high. Two of those icebergs came together, and the water flew up higher than the top of them. As they go along, they make a current in the water. There are not many peaked bergs: they are mostly flat. It is sunny and clear; but the ice makes it cool. I see some come down and balance on the water, and then slip down into the sea. One with a big rock at the bottom sounds like ten thousand men filing saws. I see some of the bergs melt till they are nearly round."

The next examination was of a small limestone bowlder from New Brunswick, taken also out of drift-clay.

"I see icebergs that look like mountains. There are cracks in them, showing all kinds of colors. There are some men in the water in a little canoe.

I see a man riding in a sled drawn by some kind

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of deer. There is nothing green here; no plant of any kind.

"I see the back of a whale away off. He is floating and spouting.

"Water has been pouring down from the top of an iceberg; and it has made an icicle that is very large, and seems to be two hundred feet long.

"An animal in the water has a fish in its mouth. It has two great long tusks. It raises up the ice. It scared me. I see now it is a walrus. There are many of them. There are large white birds on the icebergs: why, the air is black with them! I see three seals too. It is quite cold. I see another whale. The spray that he throws up comes on to me. He is a monster. There are great holes where he spurts up the water. It makes a kind of roaring noise. I don't see many kinds of birds, but a great many of those white ones. They have a curved bill. A large walrus is floating on a cake of ice.

"Now I see an animal that looks something like a whale. It spouts water, but has a long horn of bone away out, and something white, that looks like a clear part of the bone, winding round and round it.

"A white bear is running after a man. The man has stuck a spear into its mouth. He is covered with fur. He has killed the bear, and is pushing it, one end at a time, toward his little ice-house. I see three more white bears now.

"Those men have not much forehead, but large backhead. They look stout, and are dark-complexioned and tough. I see a number of their ice-houses. One man is going to spear a walrus. There is iron on the end of his spear. He has a long rope to it."

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(1.) The ordinary advance of a glacier is very slow, — not more than from six to ten inches a day; but near the sea, where a declivity was steep, and there was nothing to prevent progress, masses separated from the main body would move with great velocity and immense power, just as he describes them.

The unity observable in these examinations is one of the most interesting features. The ice shoving the bowlders; the crevices in the ice, or cracks as he terms them; the prismatic colors reflected from it, and the bowlders on the top of it; the icebergs in the ocean; the men drawn by "some kind of deer;" the walrus, whale, white birds, and white bear, — are all in keeping with the time. Nor is there, as far as I know, one unlikely statement, unless it is that there was iron on the end of the spear with which the man attacked the walrus; and even this is possible, as meteoric iron has doubtless been used by savages for such purposes from a very early time.

COMMENCEMENT OF THE GLACIAL PERIOD.

Glacier-scratched pebble from Syracuse, N.Y. Knew the character of the specimen.

"I see the ice sliding along into the ocean, and melting. There is a great bank where the ice comes down from a high hill, and tips over into the ocean. It seems to be nearly through; for I see a good deal in the ocean. There it breaks all up into pieces." ("Go back and see the cold time come on.")

"Oh, I see it! It is hailing great masses of ice, large as my double fist; and it is snowing too, — very

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large flakes. The hail makes a great noise when it comes down, the pieces rattling against one another. The air is so dense, it is almost as dark as night. Before it came on, some animals were there. I can see the big chunks of ice hit, stun, and kill them. They fall, and kick till they die.

"I don't think any thing could escape from that. I can just see a light place where the sun is: the rest is dark as night." ("See how far it extends.")

"I see places it has not yet reached. Great cakes of ice are coming down. I hear them go splash into the water.

"Oh! how strange it is to see it so, and then look up and see it all light! (I could not hear that sewing-machine at all.")

("Rise above the storm.") "The clouds look as if they were the ground; and the wind is driving them along. The cloud is for hundreds of miles right along, and you could walk on top of it. The winds won't let it down: it blows it off slantways. You ought to see the sea! The waves are high as any mountain. I can hear the ice break and crack. (I am below again.) Now I am up. It looks good to see the sun above it all. The cloud seems like ice on water. The air holds it up. It is not in one mass, but in pieces. To go through it seems like diving. The wind is very violent: it is blowing every thing before it, even this very large hail after it reaches the ground.

"The cloud goes along as fast as a locomotive. It builds a great wall of snow and ice as high as this house as fast as it goes, and leaves it level behind, filling up higher and higher; and the great wall travels

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in front. On the ocean I can see the water thicken and thicken as the cloud goes. The country is all pleasant and nice south of that." ("Go north through it.") "I have gone so far, that I am past it. That cloud seems travelling round the earth. It is clear and cold, and all snow beyond it."

There are many facts which indicate that the glacial period came on very rapidly, — the occurrence of the remains of mammoths and rhinoceroses, the flesh still upon the bones, in the ice-cliffs of Northern Siberia; the finding of the wood of large trees in the drift-deposits of Kansas and Iowa, — trees that could never have grown in a time of intense cold, such as must have preceded the glacial epoch if it came on gradually, the absence of fossils indicating a gradual change of climate. From the luxuriant life of the tertiary we pass at once to the drift, which, with but little exception, is entirely destitute of fossils, as the land during the period of its deposition was of life.

Sherman's examination — and it has been corroborated by other independent psychometric testimony — indicates a sudden change in the inclination of the earth's axis, and an instant condensation of all the aqueous vapor contained in the atmosphere of the new polar region, and this precipitated at once on the earth. But, if this did take place, our planet must have returned eventually to its original position, or nearly so, and that gradually.

THE COHOES MASTODON.

When visiting the Geological Museum at Albany on one occasion, I found James Hall, the well-known

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paleontologist, busy putting up the skeleton of a mastodon, found at Cohoes, in the State of New York, in a pot-hole, and covered with drift-material. I obtained some small fragments of the skeleton, and subjected one of them to psychometric examination by my sister, Mrs. Anne Denton Cridge. A portion of her statements corroborates remarkably some of those in the previous examination.

"I see a monstrous reptile like an alligator. It must be twenty feet long. Its tail curls up. There are many younger ones. The climate is warm and moist. It reminds me of the heat and moisture of a hot-house. Every thing indicates a warm climate. The air is full of insects. There is life everywhere. I feel afraid to step among these lizards large and small. One is blue, with large eyes. How hot the sun is! It is now setting after a hot day. If man was ever here, he was wild. There are monkeys here. What a horrid one I saw then! It looked neither like an orang-outang nor a gorilla. These small reptiles don't trouble the monkeys much. I see them seize the lizards, and dash them to pieces against the trees. The monkeys are as large as a boy of ten, and very strong.

"Now I see another animal with a very large body, a small, pointed head, and large eyes. Its mouth turns up, and is somewhat bill-shaped. It is a reptile, and has very short legs. Its mouth is not large. There is life under every stone. It is raining. How it rains! What drops! Those animals care not: they are safe under the vegetation. There is a great deal of moss. It must have been in this condition for

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ages. The material gathered from leaves and trees must be thirty or forty feet thick. I am standing near a bank of it. What a fine hiding-place for reptiles! I see a big one under there now (1).

"It is cold, cold: how cold it is! Here are icebergs floating; and, as they come along, they melt. Bowlders and gravel are swept in, and cover up every thing. The ice seems to spread over every thing. That is a wonderful change. I can see ice-mountains thousands of feet high. There seem to be glaciers. It is dark overhead.

"The cold seemed to come on suddenly."

Second examination, same specimen. Nothing yet known of its character.

"I can see the reptiles, and an animal that looks like a bug; but it is as large as a crab. It is on a stone; and a reptile seems to be making for it. It is an insect, and can fly, but not very readily. It has antennæ, and convex, immovable eyes with many lenses. Its wings are a very dark brown; and its head is dark brown and yellow mixed, and the legs black.

"It looks horrid when turned over. (I turned it over.) It has jointed, hairy legs. I can see with the naked eye what it would require, in the normal condition, a microscope to see (2). It is shaped something like a bee. Its wings are clear. The back is broad and dark. It has a sheath for its wings. It must be ten inches long, and five broad. The crocodiles ate them. There is one making towards it.

"Now the cold is coming" (shivered). "I see icebergs coming, and bowlders dropped. I can see great quantities of gravel over animals completely

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buried. It comes from the north. Bowlders are dropped everywhere. There is no animal life. Some animals were frozen in. From being tropical, it becomes frigid. It is not sudden in one sense. It took a long, long time to deposit that gravel that I see. There are fields of bowlders, extending for hundreds of miles. It looks as if snow, and eternal fields of ice, had broken away in the north, and rushed to the south.

"I see a current of water at the north pole not frozen. There is a warmth there that has extended itself under the ice, and sent it south. It looks as though the sun was shining over the north pole. There is an open sea, and an open channel from there down.

"The whole ocean was affected everywhere when that cold time came. It affects the whole globe (3). I see a volcano at the north pole. What a tremendous volcano! How the lava pours out! but what a long time ago! Now there are other volcanoes bursting out."

(1.) This seems to be a description of the country previous to the drift-period.

(2.) This I have frequently observed in psychometric examination; so that the examiner can frequently see what occurred millions of years ago better than if he had been on the spot at the time.

(3.) In the infancy of geology, men who were investigating the formation of the crust of the earth supposed they saw everywhere evidences of great convulsions. More recent investigators, with Lyell at their head, discovered, as they thought, that agencies

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such as we now see at work had produced all that we behold. The truth probably lies between them. Most of the geological formations have been deposited by the peaceful settling of sediment in ocean and lake; but there have been at times, I think, terrific convulsions, such as history has never recorded.

The same specimen was examined by Sherman, who also knew nothing of its character. He obtains from it glacial influences, and the character of the country and its inhabitants as they probably were just before the drift-period.

"This takes me among the glaciers. They look handsome. I see lots of stones on them. I see the peak of a mountain, almost as straight as the side of a house. It is all snow and ice.

"A glacier is coming down between two ledges, and it spreads as it comes out. I see the snow dropping on to it at the upper part all the time.

"Oh! underneath the ice, water is running. I see a little brook rushing along. Down below it is very cloudy, but clear enough where I am. I see some bears up here, — brown bears, about as large as a Newfoundland dog. I see them pawing about bushes. The snow is quite hard on the side of the mountain; almost like ice. I see a bear that has come to a bush with red berries on, which look like the fruit of the rose.

"I see a river now. Why, it seems as if it would tear away the mountain! Great stones go down in it that must weigh a ton. It is very roily. It sweeps down gravel. I can hear the stones strike when it has

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a fall over a cliff. It splashes the water over the banks, and sweeps the mud away. The brook I saw under the glacier went to it; but it was clear compared with this river. It makes a great noise; but, away from there, it is very still.

"I see a deer now galloping over the river, leaping from stone to stone. It is amazing what a little stone it can stand on."

A few days afterward I tried him with the same specimen again. He knew that the specimen was the same that he had previously tried, but still knew nothing of its character.

"I am at the same place, the same mountain. I see the track of a deer that I saw before. That's funny." (I then said, "Go back a little, — ten or a hundred years.") "I don't know that I can go so little." ("Go back just before the cold time came on.") "I see it now. There is a good deal of difference. It is much more pleasant. I am about a year before it. I see some deer now. There is snow on this mountain, though, now. I see some small, handsome birds with blue tails, and red on their heads. I see another kind of bird with a thick bill.

"I see an animal, that, I think, belongs to the elephant family. It has a little short trunk and two tusks. It is not as large as an elephant. It has very large teeth: they have white ridges and hollows across them. It has short hair on the body; longer under the fore-legs. I don't like the look of its head: it looks deformed, — big cheeks. It seems to be all alone. It smashed a snake in two with its trunk very quickly. When it sees a tree as it walks along,

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it eats some of the leaves off it, and then, as it leaves it, twists its tail round it, and pulls, so that I hear the tail crack before it lets go. It pulls some of the trees almost over. The tail twists round some trees two or three times.

"I see a deer with the largest horns I ever saw. It is like an elk. The horns are flat, but branch out. I see some wild horses too. They look very nice. They are mostly dark brown. They look more shiny than Boston horses. What pretty hoofs they have!

"I see an animal going through the grass after the horses. It is very pretty, spotted like a leopard. It takes large leaps, and looks up at the horses, and then leaps again. (There are great numbers of rabbits. I see them darting in every direction). It is near the horses. It trembles. It sprang on to one, and bit into its back. The horse is bleeding where its hind-claws stuck. How the horse runs! and what a curious sound the other makes! It had to get off, though, the horse went so fast, and shook it. It is licking its paws. It is going back to a river, and now it is drinking. Now it lies down, and looks at a grasshopper. The flies are plaguing it. This grasshopper is pretty: it has a red body and green wings."

("See if there are any human beings.") "I see the most curious turtle I ever saw. One-half of its bill, and one eye, and part of its head, are gone; but it is all healed up. I see no people at all. It was warmer then, a good deal, than it is now.

"I see a barren place, where nothing is growing, near some mountains. I guess they are the Rocky Mountains (1).

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"I see a man now, — an Indian. Oh! if he is not a curious one. I never saw one like him before. He has a spear about three feet long, made of wood, with stone at the end. He is perfectly naked; only he has an ornament round his neck, — white stones, with holes through them. His head is flat, and large behind; and he is quite dark for an Indian. His hair is straight and black, but not long. He looks as if he did not have much to do to get a living. How straight he can aim! He is trying what he can do. He held the spear in his hand, and drew it back three times, and then struck a stone right in the centre. (I cannot see any more. It stopped all at once.")

The next evening he tried the same specimen again, knowing it to be the same, but still knowing nothing of its nature.

"I'm in a different place now. It is before the drift. I see one of those mastodons dead. It has very long tusks. It is a male. It has not been dead long; not more than a day, I think.

"Oh! I see the largest turtle I ever saw. It is making a hole to lay its eggs; for I see it scraping the dirt out, so busy! It uses its head for a shovel, and lifts the dirt out. How round it makes the hole! It came to a large worm, and ate it. It is sitting over the hole. Now it goes to scraping again. She was just trying it. She has laid an egg now. It is round, and no larger than my fist; and the turtle is as large as a tip-cart. She lays an egg about every half-hour, I think.

"I see another large mastodon. I think it is the largest I have seen. The ground sinks when it steps on

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it, — even the grass-land. It is lying on the ground, and turning over like a horse when it rolls. I can only reach half a foot above the knee on the hind-leg; although I could not walk under without touching it. This pulls trees with its tail too. It seems to like to do it. I see it pull a branch down with its tail, so that its trunk may reach it. There are large warts on its trunk.

"Now I see about a dozen baby elephants. How nice they play! They hit one another with their trunks. I don't like the smell of them. Their tusks are just coming out. On the end of the trunk there are two little things, like fingers, that they catch things with. There is beautiful grass here, as pretty as any lawn. It is not more than six inches high, and looks like fine hair on an animal.

"I see a very fine horse eating the grass. It does look well.

"I see a little snake with four little legs; but it scarcely uses them. It cannot be a lizard; but, if it is, it is the next thing to a snake. It has a forked tongue."

("What kind of trees do you see?") "Oaks, and some with leaves a foot broad, and a foot and a half long. Those trees are low, but wide-spread. The oaks have a very fine leaf." ("Any insects?") "Yes: great numbers. I see a kind of bee with a reddish-yellow body. I see a very handsome beetle with a blue shell and black legs, and yellow at the bottom; but the smell is horrid. I am by the same river that I was before."

("Can you find those men again?") "I see a place where they have had a large fire.

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"I see some large birds away up in the air. They have hooked bills, black wings, and red necks, — raw-looking. They are very large, — larger than an eagle. They fly very easily, and hardly move their wings. (This is near where I saw the mountains last night.) The birds eat large rabbits. One doubled its wings, gave a scream, and down it went on to the back of a rabbit. Its claw went right into the flesh. It is flying to a mountain now that has snow on it. While it was flying, it sucked the blood of the rabbit from the hole its claw had made. I can see three frogs in its stomach, and a lot of other stuff, — some feathers. Now it has reached the mountain, and is tearing it up. The frogs in it are larger than those we have now. I see part of a snake in it too."

(1.) Probably the Adirondack.

GLACIAL PERIOD IN MAINE.

Most of the examinations recorded in this volume have been made by members of our own family, for the reason that it was so much more convenient, and not because others do not possess the power. I find that the faculty by which the examinations are made is not a gift so exclusive as to be possessed by but one in a million; and I have been surprised to find that several persons who had given but little attention to the subject previously have been able to make very satisfactory examinations when the experiment was tried. The following experiment was made with Mrs. Nellie L. Palmer of Portland, Me.; the specimen being a pebble of granite, with barnacles attached, dug out of a bed of shells lying between two

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glacial beds in Portland, and at a height of eighty feet above the present sea-level. She saw the specimen; but I am quite sure that she had no idea that it was connected in any way with the glacial period. The specimen was held in her right hand (March 15, 1871), and not placed to the forehead.

"It seems a good deal colder than here. It seems an awful cold place, — sharp, strong, stinging cold (1). This is but a small piece of a great rock that seems to have been worn smooth and small. I seem to be going on and on (2). It seems to have been poured down a slope that lay at about an angle of forty-five degrees (3).

"Water seems to be carrying sand, pebbles, and mud round and round.

"This seems to have been a large rock on the side of a high hill; and something comes along and breaks it off. It is not water. I do not know what it is. It carries it along, and rolls it over and over, and breaks it up. (This is a long time ago.) The seasons change. They become shorter as I come this way. There were only two seasons away back.

"This moves slowly; yet it makes a noise, — a dull, heavy noise, grinding like heavy machinery. As it goes, it takes up every thing, and carries it along, — stones, shells, bushes, and every thing (4).

"This was away below the water, and then was lifted up (5). All at once I come into the light. There are large rocks, bowlders, near where this was, — large ones, and a great many of them. They are rounded by being rolled and ground round. There is not much fine gravel" (6).

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(1.) The cold of the glacial time must have been of this character.

(2.) She appears to obtain the motion of the glacier. It is quite common for some psychometers to feel the influences that have operated on the specimens they are examining.

(3.) There is just such a slope where the specimen was obtained.

(4.) The action of a glacier is very accurately described.

(5.) Beds there, that were below the water-level at the glacial period, have been lifted up eighty feet.

(6.) There are a great many bowlders, and of considerable size, near where the specimen was obtained.

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CHAPTER II.

ASTRONOMICAL EXAMINATIONS.

A BOY'S VISIT TO VENUS.

THE first astronomical observation that we ever made was in 1860, and is recorded in the first volume of this work. The first examination that Sherman made was in Ohio, near Painesville, in 1866. We were in the orchard in the evening, after supper. Venus shone like a young moon in the western sky: and I said, "Look at that star; and then shut your eyes, and tell me what you see." What he said I wrote down, as best I could, by the light of the stars.

"I see it round, but all rough. I guess it is more hilly than this world. The mountains seem higher than they do here (1).

"I see a tree larger than these round here, just like a toadstool. It is a kind of purple color. It has a monstrous trunk, larger than any I ever saw before. I see many of them. They are as thick as the woods down here. There are not as many on the mountains as on the plains. Inside of the trees is jelly-like stuff as sweet as honey. I tasted it. There is something hard inside that I spit out.

"I see a kind of animal, half fish and half muskrat.

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The tail part looks like a fish, and the rest like a musk-rat. It is in a brook, or stream. Under that stream is a kind of rock, from which something rises like gas, that is very poisonous. It is a great deal warmer there than here. It seems almost as if it would burn me, it is so hot. The sun looks larger, — very nearly twice as large (2).

"Just then I saw a shooting-star from there. It changes from day to night, and from night to day (3).

"The water is heavy, — heavier than our water, — and it does not wet. It feels cool; but it does not wet my finger. It is clear as crystal; but it is hardly water. What would you call it? It runs; and, where there is a fall, it comes down hard, and makes an awful noise, — *clump, clump;* not steady (4).

"The mountains are almost perpendicular. I have to put my head back to see the top.

"I see no trees with leaves on. They are all of that toadstool shape, or they have a few branches on them that end in roundish knobs (5). The roots of the trees go straight down, and curl like a corkscrew, getting smaller and smaller. Every thing is very different in that world from ours.

"As I went to it, I could see it as big as this house, then growing out on both sides till I was on it."

(1.) According to Schröter, there are mountains on Venus five or six times as high as our highest peaks; but Herschel seems to think that mountains no higher than those on our planet would account for the appearances observed by Schröter. It seems, however, to be generally agreed that Venus is mountainous.

(2.) An observer on Venus would be about twenty-

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five millions of miles nearer the sun than one on the earth; and the sun to him would appear as much larger in proportion as 729 is to 400, or "nearly twice as large."

(3.) As I understood him (though I did not question him at the time, lest it should disturb him), he saw the planet in the light and in the dark. Part of the time it was night, and part of the time day; and he therefore saw it, not exactly as it was, but as it had been at some previous time. This introduces an element that needs to be taken into account when considering the reliability of these investigations. Psychometers readily pass from one time to another, and are not always aware of the change.

(4.) Is it possible that some other liquid takes the place of water on Venus? or was this some local peculiarity?

(5.) Trees in this form would evaporate much less, and be therefore better able to bear the extreme heat to which vegetation may be exposed on Venus.

Sherman, at that time, was nine years of age, and did not even know the name of the planet that he was examining. An older person, acquainted with the facts of astronomy, might have guessed at the conditions there after this fashion; but this the boy could not have done.

VISIT TO A COMET.

While examining a date from one of the Theban tombs of Upper Egypt on July 20, 1870, Sherman said, quite unexpectedly,

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"I am in a place where it is night, and I see a very large comet. It is the most splendid one I ever saw. It has a star-like head, and the tail curves and broadens toward the end." ("Visit it, and see what it is.")

"I guess it will be something like going to a rainbow.

"No: it is not like that. It looks miles long and wide now.

"There are a good many masses, and they are burning. Some are no larger than seven or eight rods through. How globular they are! What can be the reason of that? The largest attract the small ones; and then they fly off again, and that makes it sparkle. When they throw off the little planets they whirl tremendously, and make a great noise. Sometimes they hit against others. What magnificent fireworks! All are whirling. Some little ones are no larger than this room. Oh! isn't it handsome? This is in the tail part of it.

"I think I see how it is made. It is one big planet at the head; and all these seem to be pieces of it, as if it had been smashed. It seems to be going at a great rate. Do they ever go? There is a tremendous noise. A long way off, it sounds like an enormous sky-rocket.

"The front of it is the fieriest part of it; and it goes so fast, that it keeps it on fire. It seems as if it was burning away. It seems like a great meteor (1). When I am there, it does not seem to go at all. As the little pieces go to the tail, they burn out altogether (2).

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"When I am on the earth, the comet seems still. As those planets whirl, they keep their heads in the same position (3).

"The head of the comet is a large planet: I don't know but it is as large as the earth" (4). ("Advance in time, and see what becomes of the comet.")

"Why! it keeps getting smaller (5). What can be the reason of that? The head now is quite small. It looks almost exhausted. It could not be seen from the earth now. It does not seem over a mile long now altogether; but it is going as fast as ever.

"It seems to turn its course now, and go off to another planet. That is the last I see of it."

("See where you are.") "I see no people, and no signs of any. It is a very swampy place. A man in there would die before he could get out. This comet gives nearly twice as much light as the moon. Oh, what a place this is! There are crocodiles and turtles that look like snappers. I see some long-necked white birds, very handsome. They fly in the night."

(1.) Since this examination was made, the identity of comets and meteors has been announced as established. "In the year 1862, the denser portion of this ring of meteors — through which the earth passes annually on the 10th of August, and which causes the display of falling stars — was seen in the form of a comet, with head and tail as the densest parts, approaching the sun and earth in the course of that month." * When we have meteoric showers, as about the 10th of August

* Science Record for 1873, p. 539.

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and the 13th of November, we are passing through the tail of a comet. The meteorites composing it, coming in contact with our atmosphere, burn in consequence of the friction between them and the air, and we see their fiery track on the evening sky. So little did Sherman know of this, that he did not even know that comets travelled, as his previous question shows.

(2.) That is, they became invisible to him.

(3.) As I understand him, the direction of their whirling motion was at right angles to the direction of their motion in space.

(4.) The younger Herschel was of the opinion that the faintest clouds were dense, compared with comets. But some other astronomers differ materially from him in this. "The mass of Donati's comet has been valued by MM. Faye and Roche at about the seven-hundredth part of the bulk of the earth." *

(5.) This, though remarkable to him, is by no means uncommon. When in the vicinity of the sun, the tails of comets generally acquire great length and breadth; and this is probably at the expense of the head. As they recede from the sun, the tail becomes invisible, being probably absorbed into the head.

VISIT TO A SMALL PLANET.

We had been making examinations of Mars and other planets for some time, when on the evening of the 10th of June, 1869, the weather being somewhat misty, Sherman said that he could not see Mars; and

* Guillemin's Heavens, p. 261.

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I asked him to find and describe some other planet, if he could. In a short time he said, —

"I am at one, — a very barren place. It seems like a young world. There is not a tree on it. It seems one crust all over. (I saw a fine meteor just then.) It is all cool too; solid through (1). There is not a drop of water on it. It seems to be a small planet, and turns over about twice every hour. There are cracks in it almost half way through. It looks like pumice-stone. It is very light. It is perfectly round, except the cracks. It does not seem any more than five miles through. I see pretty veins in the rock on the sides of the cracks. They look like the dross of lead. A man would not weigh much there. There is no sign of life. The night is dark as pitch, and cold; and the day hot, and very bright, so that it dazzles my eyes (2). The black rock reflects the rays of the sun.

"There are no mountains, nor any elevation at all. It is all smooth but the cracks that have been formed by cooling. There is no air at all.

"There are some metals in it as heavy as lead. There are round balls of metal in the inside that show in the cracks. They are round and glossy. They look like those silvered glass globes I have seen in stores, and they are as smooth. They are metal itself.

"There is so little weight, that, when a fragment gets loose, it does not stick. I see some that go up, and then down till they nearly touch it, and then rise up again, — some as high as thirty feet" (3).

("See if there are any other planets near.") "I am attracted to this one.

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"When I rub my hand on some smooth bubbles about half a foot high, there is a black powder that rubs off. I can see it on my hand: I feel it too.

"I can hear the planet crack like ice under my feet once in a long while. If a man could earn a dollar a day there, he could make some money in one of our days. The two biggest cracks are about a mile wide.

"There are lots of pieces of this planet away up,—enough to make a planet a mile through. Some are mountains, and they go round the planet in circles like the rings round Saturn (4). They would be rings if they stuck together. They turn round on their axes, but slowly,—not nearly as fast as the planet (5). The circle goes round as fast as the planet."

He pointed to a place in the heavens, about twenty degrees south of the position of Mars, as that where the body was located.

(1.) I think it probable that this was one of the asteroids, or small planets, between Mars and Jupiter, cooled to the centre in consequence of its diminutive size.

(2.) There being no atmosphere attached to this small planet, as he subsequently learns, there is consequently no modification of the heat of the sun, on the one hand, nor the intense cold of space, on the other.

(3.) The centrifugal force generated by the velocity of the planet is about equal to the attractive force on this small orb. A very similar condition of things was seen by my sister, Anne Denton Cridge, at Wash-

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ington, D.C., at a time when she had not heard of this examination; as, indeed, she has not yet.

In a letter from my brother-in-law, Alfred Cridge, he writes, —

"On Jan. 7, 1870, while examining Venus, Mrs. Cridge saw Mercury, and also a planet whose orbit was within that of Mercury, and of which the description is as follows: —

"'It is about one-eighth as large as Mercury, is uninhabited, and entirely volcanic. Though sufficiently adhesive to keep together, it is rather liquid than solid. As I see it moving round the sun, I can perceive large and small portions of matter, here and there, in constant motion, alternately attracted by and repelled from the planet, something like a number of balls tossed by a juggler. The planet gathers up floating particles of matter, apparently, as it proceeds. There are no indications of life whatever, — not even of vegetable life.'"

(4.) It is now generally supposed by astronomers that the rings of Saturn are composed of bodies that are thus revolving in circles around the planet.

(5.) If this statement is correct, the fact seems strange. In accordance with what he has generally observed in the case of small satellites, it was to be expected that they would move with great velocity.

A COLLISION BETWEEN TWO WORLDS.

Between Mars and Jupiter there is a space of about three hundred and forty millions of miles, in which more than one hundred and thirty small planets have been discovered. The largest is a little less than the

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moon in size; and the smallest not more, probably, than twenty miles in diameter. The astronomer Olbers suggested that these small bodies were fragments of a planet which had been destroyed.

Without thinking at the time of these bodies, and without Sherman's knowledge of their position, or even existence, on the evening of Nov. 13, 1870, while looking at Jupiter, he said, —

"Oh! there are a great many little stars between that star and here, — very little ones. I came across them as I was going. I see one no bigger than this house. There is a hump on one side; but it turns so fast, it is all I can do to see it. What a noise it makes! — a buzzing noise. Some are not more than a rod from another. I see two so close, that I could step from one to the other. One of them is quite long, and another is about a mile round. It turns round about once every minute; but the motion is unsteady. Some are going one way, and some another. Sometimes they strike together, and fly off again. Pieces are knocked off, and they twirl round; but most of them fly back to the large ones again. It looks like daylight where I am. I can see the sun."

("Can you go back to the time when they were formed?")

"I am back to a time when they were all together. There were two large ones about half the size of this world, I should think; and they ran together, and smashed to pieces. There was melted matter inside of them too; and I can see that boil up, and fly every way. Those worlds were quite round; only they were much broader one way than the other, — round, but

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flattened like a cent, only not so much (1). I can see them grow smaller after they broke off (2). There are larger pieces away off that I cannot see. This star (Jupiter) does not look any larger from the little stars than it does from here, that I can see" (3).

(1.) Jupiter's rapid motion on his axis has caused his equatorial diameter to be forty-nine hundred miles greater than his polar diameter. Had his axial motion been sufficiently increased, his shape would have been like that which Sherman describes these planets as having.

(2.) Some fragments would grow smaller in consequence of loss of heat; and others, perhaps, by collision with neighboring bodies.

(3.) The nearest known asteroid is more than a hundred and fifty millions of miles from Jupiter; and Jupiter, from that distance, would not, probably, look any larger. It would show no disk, though it would look brighter than it does from here.

A few evenings afterward, while examining Jupiter, he met with the small planets again.

"I came across those little stars again. There are not a great many of them; only a few hundred (1). What makes them turn round? There are only a few compared with what there were. I see one that is pretty large: it seems like half of a planet that had been split.

"I declare! I cannot go more than half way; then I stop. I try to go, but stand still. I don't get along any. I seem to go back as much as I gain (2).

"As I am going, I can see some of the stars shift

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their places; and I can tell by that whether I am going or not, and whether the stars are far off or not.

"I see some trees growing on one of those little planets, which is no larger than our place" (thirteen acres). "The trees are very small, — no taller than a man; but they have the shape of trees."

("Is there any water?") "No: I see no water, — not a drop; but I see clouds, though. The planet is not round, but flat; a few hundred feet thick. It goes round fast; but, when I am on it, I do not notice it at all (3).

"I see a small beetle on one of those trees, a little larger than a lady-bird. There is a good deal of grass. It must rain sometimes. It is very warm all the time. The rocks are of a reddish color, and look very hard.

"I see one planet that I saw the other night." ("Can you see the moon from there?") "No." ("Look at the earth.") "It looks very large, — about as large as the moon (4).

"I am on the largest. I see a couple of lakes on it. I can see the heart of it. It split right through the centre; and I can see the rings of rock. It is mostly of a red or chestnut color, with dark rock that makes the rings. There are forests here. It is quite a world, and looks very much like this. I see where there have been great caves, and they are all exposed. Where it broke, it looks like a great plain, over which you can see such a long, long way, with masses of rock sticking up here and there over it. A man could walk on it just the same as the other; but nothing grows there. It is nothing but bare rock. One could tell in a minute that something awful had happened

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to it. This world turns round slowly; I should think, in about half a day. There are some very smooth hills (the matter must have been melted when it split); and others are all ragged and craggy."

(1.) This, I think, refers to the group in his vicinity.

(2.) When making such examinations as these, my opinion is that the spirit flits back and forth with great rapidity, and almost unconsciously; and this seems to be true when examining the distant in time. This inability to move at will is not uncommon; but no psychometer seems to be able to give the reason.

(3.) Any more than we notice the rotation of the earth.

(4.) That is, of course, impossible. The earth could only be merely visible from that distance; and he probably mistook some asteroid for it.

A BOY ON THE SUN.

A few months afterward he examined the sun, sitting where its rays could shine upon his forehead.

"I see a world all lava. I tell you, it is hot. It is all an ocean of fire. It is so hot, that a body would melt a million miles off, or turn to a black coal. It is not fluid, like water. You could run on it in places. They move about; and it is slowly getting more crusty."

Spectrum analysis has now demonstrated that the sun is an intensely-heated body; so hot, indeed, that many metals with which we are acquainted exist in its atmosphere in the condition of vapor. The statement

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that it is not fluid does not agree with subsequent examinations that he made, but may refer to the "places" on which a person could run, — sun-spots, as I think.

He made a second examination of the sun in October, 1868.

"I can see mountains. Now I am on the sun. The mountains are heaps of lava in great waves. It is not near as bright when you get there (1). It is all lava, tossing every way. There are dark places in it, like those on the moon. They are like foam on water at a waterfall. It is all full of bubbles. All the dark places look reddish, not as bright as the rest (2). Oh, it is beautiful! but it looks better away off. There are cracks in the dark places down to the light. It is so bright, it dazzles my eyes. The dark places are not very thick: they do not seem to be more than a foot (3). I see streams of pink, blue, green, and yellow, flowing about. The yellow looks the brightest. I think they are different kinds of metals (4). It looks as the earth did once, or as it is inside now; only there are no dark places there. Two waves, as high as any mountain I know of, come together, and dash up the matter.

"It is like being in the ocean on a log, out of sight of every thing. It looks pinkish through the smoke; but, when you get to it, it is of different colors. I never saw such pretty colors. It is of no use to try to tell it. It cannot be told.

"There is black smoke rising from the surface all over, and from the cracks in the dark places (5).

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The surface shakes and trembles all the time, and rumbles as I have heard a furnace in a foundery when iron was heating. That smoke is black, and smells worse than sulphur. It goes up and forms clouds, but they are not thick, and then disappears. The surface is bright for thousands and millions of miles; and then comes a dark place. I see a large blue stream that flows among the lava, like roily water among clear. I don't like being here: it is just like having the nightmare."

He described several planets between here and the sun. I may give some of the descriptions, which are very interesting, at some future time. (I said, "Go into space as far as you can.")

"Now I am away out of every thing. I can see nothing at all: it is all dark. I cannot see my hand before my face. I do not believe I could see a candle, it is so dark. The farther I go, the colder and darker it gets. It is terrible. It seems as if I could never get back. I can see something away back, like a pin's head or a fire-fly off on the hill. I guess it is the sun. Now I cannot see it at all. It is horrible! I must be blind (6). There is a peculiar smell here, — splendid! It smells like strawberry-essence or perfumery (7). I am tired. I cannot go any farther."

(1.) The intense brilliancy of the sun may be caused by flames in its atmosphere; and the body of it may be much less brilliant.

(2.) These dark places to which he refers are, as I think, the sun-spots, which, although they are much darker than the rest of the sun's surface, are, never-

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theless, intensely heated. When Mercury was making its transit over the sun, the spots seemed the brighter.

(3.) Sherman's view is most in harmony with the theory of Ennis. "The spots," he says, "are solid bodies, floating in the midst of flames on the liquid surface of the sun; and they are formed of incombustible chemical compounds." * That they are thin is indicated by the fact, that they have been seen to break up and disappear while under the telescope of the observer.†

(4.) In the light of the now well-ascertained fact, that various metals are burning in the sun, it is quite probable that rivers of variously-colored metals are flowing about upon its surface.

(5.) This, at first sight, seems very unreasonable, but less so upon mature reflection. We may suppose that whatever burns on the surface of the sun rises as smoke till it reaches a layer of oxygen that will cause it to inflame. The attraction of the sun then draws the condensible products back again as rain, only to burn again; while the more refractory material collects, and forms spots, till in time they are reduced, burned, and disappear, to be succeeded by others. This, I think, well accounts for the facts known with regard to the sun and its spots. The spots appear to occupy cavities, because the smoke and flame tower above them for an immense distance.

(6.) He seems to have been in that immense sea of darkness that separates our solar system from the rest

* The Origin of the Stars, p. 93. † Ibid., p. 92.

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of the universe. I have never yet met with a psychometer that appeared to be able to cross it.

(7.) The imagination is lost in attempting to account for this. These grand celestial spaces are by no means unoccupied.

MRS. CRIDGE'S EXAMINATION OF THE SUN.

I have received from my sister, Mrs. Cridge, a series of psychometric examinations of the sun, made in January, 1870. They may be published entire at some future time. I give the following extracts from them, which may serve to give a general idea of what she perceived at the centre of our system.

THE ATMOSPHERE OF THE SUN.

"After repeated trials and repulsions, I finally succeed in entering within the sun's atmosphere. From this *atmosphere* we receive our heat and light. It is so dense, that it strikes one as strange that it should be gaseous. It is luminous, and intensely magnetic. . . .

"I am conscious of being at the heart of the influences controlling the solar system, realizing (though ignorant of details, or methods of action) the thread of connection between the sun and the planets, — realizing that which causes them to revolve around that immense magnet.

"Here, in its intensely-magnetic atmosphere, I pause. So dense that it might be regarded as a condensation of all bodies, it is, nevertheless, vapor, composed of many elements; magnetism, such as

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inheres in the loadstone, being its central life, and which, existing in a much more concentrated form in the body and heart of the sun, causes the planets to revolve around that body. Being here at the centre of attraction, there comes from afar a realizing sense of other attraction operating *on* the sun, which causes it, with its attendant planets, to walk, as it were, among the stars. . . .

"I find myself within the sun's atmosphere, which is of wonderful density, being composed in great part of substances, which, at the highest temperatures known to us, would be solid, but here are gaseous.". . .

THE HEART OF THE SUN.

"And now I endeavor to penetrate to the very heart of the sun itself. I leave one part of myself at the threshold, sending another and more subtle part far into the interior. I go on and on and on, until all is one molten mass, — not a dark speck in it, — clearer than crystal, yet not crystallized; without flames, without fire, yet far more subtle and pervading than any heat of which we can conceive. Language fails to convey an adequate idea of its calm intensity. I think it is wholly electrical; but will examine farther. It is not a *consuming* heat; in this respect differing from the heat in the sun's atmosphere. . . .

"I am confident that the great power operating in the heart of the sun is magnetism, which becomes modified into heat as it approaches the outer portion (1). I see that no cooling process is possible at the

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sun itself: that can only take place after the material has been ejected into space. . . .

"The material in the very central portion of the sun, though so highly compressed as to partake of some characteristics of a solid, is, nevertheless, gaseous (2). The compression to which it is subjected is so enormous, that, were it gross matter, it would be harder than any thing of which we can conceive. I can give it no name. I know of nothing akin to it, unless it be the attraction of the needle to the loadstone. This attractive power is tremendous. I can look at it; I can place my hand on it; and it impresses me as containing sufficient power to bring to itself every planet in the solar system. I can perceive the globular particles of which this attractive material is composed, and that they are constantly in motion among themselves. They would be, probably, invisible to the physical eye.

"On receding from the centre of the sun, no marked difference in the intensity of this force is experienced until the outer portion, or atmosphere, of the sun is quite near: then the sensation of pressure perceptibly lessens; there is an approach to grosser matter in a gaseous state; and the whole is in motion, having its calms and its storms. I have but a dim perception of the causes of these movements. I perceive, however, quite clearly, that the sun not only has a motion around its own axis and around a central sun, but that the particles of matter of which it is composed have a constant motion among themselves.

"The great bulk of the sun is composed of this

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powerfully-attractive, highly-condensed, but gaseous material, which reaches to its centre. Near the outer portion of this material the transition to the outer layer of the sun commences; the same interior material, however, permeating the whole, and embodying the essential principle of the magnet, without the grosser matter by which the magnet is accompanied."

(1.) From this and other psychometric examinations, I think it probable that electricity and magnetism are different forms of the same matter, which constitutes the heart of the sun, as it probably does that of the earth and all the other planets of the solar system.

This involves, of course, a complete revolution in the commonly-received opinion regarding these so-called "imponderable agents," which are possibly only regarded as imponderable because we have hitherto been unable to obtain them in such a form as would make their gravity perceptible.

(2.) Mrs. Denton, who has made several examinations of the sun, without knowledge of those made by Mrs. Cridge, and which she may publish at some future time, regards the matter at the absolute centre of the sun as more dense than any substance with which we are acquainted, and as impenetrable by any known physical force.

THREE INDEPENDENT PSYCHOMETERS EXAMINE THE PLANET MARS.

Mars is, in many respects, the most interesting planet visible to us. We can see it better than we can any of

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the other planets, — better than Mercury, because Mercury is too near the sun; better than Venus, because it is not so cloudy; and better than the other exterior planets, because it is so much nearer to us, the nearest being eight times as far off as Mars when it is nearest.

The astronomical examinations of Mars give us strong indications that it must be the abode of life. The day of Mars is but half an hour longer than ours. Its year is six hundred and eighty-seven days. Its diameter is a little less than half that of the earth; and bodies weigh, in consequence of its less gravitating force, not half as much as they do here.

In many other respects, this planet resembles the earth much more closely. Clouds have been seen in its atmosphere, and even plain indications of fogs and mists. The outlines of seas and continents are visible; and two snowy caps, covering the north and south poles, are seen to enlarge as winter approaches, and diminish as summer returns. It has been noticed that the sky is most cloudy, and the features of Mars most obscured, in winter, as is the case with the earth; and even changes from hour to hour — as the morning fog is dissipated, or the evening mists appear — are observable to the telescopic seer.

In Mars, the land and water spaces appear to be about equal. The water forms long inlets and straits; and it is said that a traveller might sail almost round the planet with land constantly in sight on both sides, while those who dislike water-

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travel might visit nearly every portion without the necessity of trusting themselves to its yielding surface.

From what the astronomer knows of Mars, there are rains and snows, and elevations and depressions of surface; therefore springs and rivers; hence sediment in the waters, and alluvial formations and sedimentary rocks. The fact that land exists above the water-level indicates a cooling globe, ridging up as the disintegrating agencies wear it down. In fact, it must be a world very like our own, and well fitted for the sustentation and development of life.

If there is life, what are its manifestations? Does the vegetation resemble that of our own globe? Are there animals, and, above all, human beings? What is their character? Do they sin and suffer? Are they savages such as, at one time, the best specimens of our race were? or have they all ascended the heights of philosophy, near the base of which we are painfully climbing? To such questions, and a thousand others, Astronomy can only shake her head, and confess her ignorance. But the soul has a telescopic eye of keenest vision, as much superior to that of the body as the spirit is superior to its material envelope.

Many persons, clairvoyants and others, have given descriptions of inhabitants on Mars, Jupiter, Saturn, and even on the sun and moon, — descriptions differing very widely from each other, as some of them differ very widely from known astronomical facts. Some persons have professed to see the inhabitants, and describe what appeared to their vision; while others have

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informed us of what they said departed spirits had revealed to them. How are we to know which account out of the number is the true one? or whether any is true? The only way, it seemed to me, by which we could arrive at the truth, would be to obtain independent examinations of a planet by various parties, no one of which should know any thing, previous to the examination, of what the other had stated. Three independent examinations have thus been made, which I present. Not a hint was given as to what might be expected, or of what had already been received from others; and the reader can judge, from the evidence presented, whether there is any reason for believing that we have obtained any reliable knowledge of our sister planet.

THE ANIMALS OF MARS.

Sherman's first examination.

On the 12th of January, 1867, Sherman made his first examination of Mars, not knowing, at the time, even the name of the planet.

"I see a thorn-tree with large thorny apples on it. I see no animals. Yes: I see a snake winding up a tree, and eating something that looks like a little white cabbage-head.

"I have come to the seaside, where the water makes a peninsula. The sun does not look as large as it does here, — about one-third as large (1).

"I see a monstrous animal like a turtle, all covered with conical spines, even on its legs. It has four legs and a stumpy tail. It is a mud-turtle, but eight or nine feet long.

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"This world seems flat, like ours. It is a real clear day; but it is not as light as it is here. It does not get as much of the sun's light. The water does not taste like our water. It has a sweet taste, or half sweet.

"I see another turtle coming out of the water, and still another. They are eating animals with long legs that are spotted, and jump, but are not frogs. There is a rock, near where I saw the turtle, of a reddish-gray color.

"I see an animal jumping from tree to tree. It has very great paws, and reaches from one to the other, and springs. It is as large as a horse, or larger; and has short bristles on its body. The trees are monstrous. Those with apples on are not so large.

"There is a great deal of water here. From a high place, where I am now, I can see hundreds of lakes.

"What a lot of little turtles I see at the bottom of the water, scrabbling and piling on each other, and squeaking! There are thousands of them no larger than a hen's egg, with little prickles over them like needles. They bite hard too. There is a big shell there, and they are eating the meat out. One has run off with a piece, and the others are after it. Two are pulling at one piece. One turtle has got the door of the shell, and is going off with it. The shell is as large as a peck-measure.

"I think it is near the equator. The sun shines overhead all the time. The sun is not perfectly straight overhead: it slants a little. It is not easy to move about."

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THE PEOPLE OF MARS.

"I have come to a place where the people are crowding into a little house that looks like a summer-house, where a man is standing with a basket of flowers. It is a statue, made of something like plaster of Paris. They have on strange-looking square caps. The men and women wear the same kind; only the men's are larger.

"Now I see a great temple. They are going in rows, and divide near the statue as they go into the temple. It is very large and high. I see them going up winding stairs, up and up. Some are giving out, it is so hard, and sit on the stairs by the way. They go up a flight; and then there is a place to walk, and another flight. It is so high, that the men at the bottom look no larger than my finger. I can look over the houses to a beautiful lake, another city, and another temple, that I can barely see. I do not see that they are doing any thing but looking off. Now I see a place where people go in; and there are several statues. One man has his head bent over, as if praying. The people look at the statues: and some point to that man, and talk; but I cannot understand them.

"The people are darker colored than ours, and have four fingers instead of five, — three fingers and a thumb. Their toes are the same. All that I see are barefooted. No: some have a little thing under the foot, that seems made of metal, to keep stones from hurting them. Their faces are not as pleasant as ours. Those statues have four fingers too. The people have sixteen teeth in the upper jaw, and sixteen

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in the lower. They have large, wide mouths, cut farther back than ours. The hair is yellow. I tried a number, and they had blue eyes. I see no beards, but just a few bristles on the chin. All the people are out of their houses, at the temple.

"The streets are paved with stone; and the houses are nearly flat: some are flat. I see windows, but no glass in them. I can hardly see through them. They look like mica. The houses are rather dark inside. They do not fear robbers, or they would not leave their houses this way. I see a pile of hats in one place.

"I see something that they eat. It is white, and something like bread; but it is not. I see shelves in a place like a kitchen.

"They have clothes that half cover them. They dress like Indians. Their legs are bare, — all of them that I see.

"I forgot to tell you that their eyes are like cats' eyes. The pupils are long: they look queer. They have what I suppose are chairs. They have four legs, but no backs; and the legs slant. The houses have no doors like ours, that I see. They are open, — just an entrance to go in and out. The streets are wide, — three times as wide as ours. The top of that temple came up something like a French roof. It seems warm, like summer weather."

In answer to questions, he said, —

"The men wore reddish pants and blue jackets. Some of them carried banners that glistened in the sun. Their clothes seemed to be made of a coarse kind of cloth."

(1.) The apparent size of the sun from Mars is

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between a half and a third as much as it is from the earth.

Here are snakes, turtles, small long-legged jumping animals, large bristly jumping ones, mollusks, and people so like the human beings on our own planet, that the differences between them would hardly be noticed. Although I had great confidence in psychometry, the story he told seemed to be a somewhat unlikely one, and more probably a reminiscence of the earth than a revelation from the stars.

The great types of life, as we know them on our planet, may, however, be universal, as true for Mars and Jupiter as they were for the Silurian and Devonian periods; and the perfect human form may be the highest form that matter can assume, and toward which it is everywhere striving, as it strove for millions of years on our own globe.

PHOTOGRAPHS AND FLYING-MACHINES ON MARS.

Sherman's second examination.

On March 25, 1869, — that is, more than two years afterward, — Sherman examined Mars again. As before, he did not know the name of the planet; nor do I think that he knew, before he examined it, that he had examined it previously. An independent examination of this kind would be, I thought, a test, to some extent, of the accuracy of the previous examination.

"It seems as if I was in a city. I see drawings like colored photographs: they must be colored by the light itself. The people are very curious. I see some that have hooks on their feet with springs, so

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that they go over the ground fast. They have them on their hands too. There is no house made of brick or wood: they seem to be made of a kind of stone like rough sandstone. Their roofs are steep. The stones are flattened off, and look well. The roofs are all covered with points, and look thatchy. They have some kind of stuff like glass, but so clear, that you can hardly tell that any thing is there. Their shoes seem to be elastic at the side, and metal at the bottom. The women dress the same as the men. Some wear a kind of white cloth.

"Well, they have got a new thing there. It is something like a velocipede; but it is a flying-machine, that goes along about three or four feet from the ground. Some of the best riders make it go as high as a house. I see one place devoted to that kind of amusement. There is a high railing round, and people are looking at them. The way they steer is most curious: it is by making the wheel on one side go faster than the other. Some go backward, — the best riders. How they enjoy it! It makes a great noise. They move both hands and feet (1). They have some strong and hard stuff something like bone, but much lighter than wood. (I see no one smoking anywhere.)

"Ladies ride on those machines: they are not as hard to drive as a velocipede. It is the most curious to see them go backward. There is a square block at the bottom, that seems heavy, and has spikes in it to make it stick. It is drawn up as soon as the machine goes. Two persons ride near together forty feet up, and talk to each other. They believe in wearing a long mustache. None of them shave, I

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think. Some of them dare to fly over water with that machine a mile from the land. They go faster than birds. There are a great many of them in this green, grassy place. People give something that is white and round, like a medal, to two men who have forty or fifty of these machines. On each side of the medal is a picture of one of these flying-machines. This seems to be the place for all kinds of exercise.

"I see men with those springs on their hands and feet: they spring and jump great distances with them.

"The flying-machine is about ten feet long. The person pushes a large wheel, and the cogs on that make a small one go; and then a belt from that makes fans go *so* fast!

"I don't notice any difference between them and the people here; only they have large foreheads, and their heads are large, and the hair does not grow down as low on the forehead as it does with us (2).

"Well, this caps the climax! It is a monstrous head, about twenty feet across, all made of pieces of wood joined together, and put in so nice, that you would not know but it was all one piece of wood carved into shape. A great many men are at work on it. It is on the outside of the second story of a large building. The stories are very high.

"It does not take me long to go to that planet. (What planet is it?") (Told him.) "The people are very industrious. Those fliers can go round a circle. I see them flying round and round like birds. The machine is so light, that they lift it readily with their hands. In the air it looks as if it could not be real.

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"I see a man taking pictures of those flying-machines. They come out of a dark box all ready painted. The box is longer than wide, and is made of hard wood — if it is wood — like maple. The artist takes something like paper, and puts it in the box slantwise, and leaves one corner up, and turns a glass at the other end of the box, slanting the other way. It is about an inch thick in the middle, flat on one side, and thins out to the edge on the other. Then he covers the glass with his hand for a second, takes hold of the corner of the paper and pulls it out, and there is the picture on it. That is all I see. But there is something under the box, and very fine wires, like hair, that come up near the glass. The largest pictures I see are about a foot square, and as natural as life. Their glass is more transparent than ours. It is not glass, I know. The people do not seem to notice the artist much.

"Is this the planet where I saw the three-fingered people? I don't see any now. These have all four fingers, and eyes like ours.

"This man keeps taking one picture after another, and puts them in his pocket. He has packages of hundreds of papers."

("See if you can find any books.") "Oh, yes! plenty; but I cannot read them. I see signs too, like short-hand writing. Their words are not made of letters. Their signs are gilt. (Draws Fig. 104.) I see



FIG. 104.—Word-signs.

that where there are books for sale. A man is piling

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them up. They are printed, and open in the middle. They are made of very thin leaves. I see one book about flying-machines: there is the picture of one on the first page. The printing is all like the signs. I see many different kinds of books. They are not printed the same as ours. Every thing is in tip-top style. There are a great many flourishes. The words are pure black; and the flourishes are pink, at the end of every sentence.

"All the pictures in the books are done with the photograph. The men's faces who wrote the books are there, so real!

"Is that planet older than ours?" ("Yes, probably.") "It is as warm there as here on a fine day in the latter part of April. The people look very healthy and strong."

("Travel round a little.") "They have a nice way of raising fruit. To heat the room where they have it, water goes through pipes under the soil: they have fire under it that turns the water into steam; and at the end there are fine holes, where it comes out in steam in the soil, and warms and moistens it at the same time (3). Sometimes it comes out so hard, it blows up the soil.

"I see a fruit like the strawberry, as big as my fist, and as round as a ball. It tastes something like strawberries with sugar and cream."

After the examination, I questioned him on some points.

"The men with springs spread their legs out, and then brought them together, and sometimes turned somersets: they seemed like circus performers. The

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enclosure holds about twelve acres. Round the fliers would go, and over the fence, and return. They looked like big butterflies when away off. The people wear beards, whiskers, and mustache; and their hair is of different shades, as here. They use broad, flat nails, that are sharp at the sides; and I saw a machine for pushing them in."

(1.) With the force of gravity not half of what it is on our planet, and with an atmosphere probably denser than ours, aerial navigation on Mars must be very much easier than here.

(2.) This is evidently a distinct race from those first seen; and they live, as I think, in a region extending from south of the equator high into the north temperate zone.

(3.) This might be turned to practical account on our own planet. The fact that they needed hothouses seems to indicate that the locality was the temperate zone.

A MONSTER KITE ON MARS.

Sherman's third examination.

While I was from home, Sherman examined Mars (on April 20, 1869), and wrote out the following paper: —

"I was near a river where there was a plain, and boys playing with curious kinds of tops: they called them *maubs*. They are made of light metal that looks like iron (1). They hum very loud.

"Away back in the land, I saw a great sight. Some people there had a kind of kite. It was round, and about twenty feet across. The frame of it was made

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of that light iron; and it had a tail made of small rope about thirty feet long. On the end of the rope was a sort of basket, about five feet across, and two feet deep; and in this basket people got, and away they went up in the air.

"On the ground was something like a windlass, made of the light iron; and a man slowly let out a rope attached to the kite, and it went up about five miles."

On my return, in answer to questions, he said that the top was spun with an elastic cord, and went very fast. The face of the kite was made of some kind of cloth, that was prepared so as to be air-tight. Before the people got into the basket under the kite, they tried it with stones. When they sat in the car, they were careful about balancing it and in keeping the balance. There was a kind of break on the windlass to regulate its motion. At five miles high, the air seemed as good to breathe as on the ground (2).

(1.) He frequently refers to this metal, which seems to be aluminum. When we have discovered some easy method of reducing its abundant ores, we shall probably use it as commonly as he represents it to be used on Mars. A metal harder than zinc, of great strength, and yet lighter than glass, as aluminum is, would be of much service to us, if it could only be readily obtained.

(2.) The height that he designates was only roughly estimated. It seems probable, however, that the atmosphere of Mars is more dense than our own.

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HORTICULTURE ON MARS.

April 30, 1869.

Sherman's fourth examination.

"I see a river about three rods wide; and something sends water out slanting on to the land. It is something man has made. There is a great wheel under the water, turned by the stream, which drives the water out of a pipe on the land to a great distance (1). It comes down like so much rain on some pretty plants there.

"Men come round, and squeeze the fruit into a kind of bowl. The juice is sweet, and pours out as if you were squeezing a rubber ball full of water. These plants need a great deal of water. I see them all along the river as far as they can make the water go. The juice is yellow. They squeeze the fruit daily. They carry off the juice in pails made of the same stuff as the flying-machines. The people wear shiny coats that are water-proof, so that the water does not wet them.

"There is a very handsome tree here, that seems to be covered with nuts, that have dark red-and-yellow bulbs under each. They cultivate them, and take great care of them. The trunk has a mossy look. The scenery is very pretty round here.

"This is a warmer place than where I was before; but the people seem the same.

"I see a plant with very red fruit, and thorny all over. It looks something like a strawberry; but it is not as sweet as it is pretty. They can't be grown for fruit. I see now. People come round when they are

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ripe, cut them in two, scrape them out, and use the material for glue, after burning it. It is something like pitch, and runs out black. Their knives are not made of iron, but of light, shining metal. The women are out working just the same as the men. They are all dressed very nice under their water-proofs, the women better than the men; but they are nothing like the women here. The women wear something like pants, and have pictures on them of flowers and things of different colors.

"Their dresses exactly fit their bodies, but don't injure them. They don't waste cloth in foolish things as our women do.

"The land was quite level where I was."

(1.) We have an immense amount of water-power going to waste along all our streams; and there are portions of the country, where, if water could be raised in the way indicated, lands at present quite sterile might be made very productive.

NIGHT ON MARS.

MAY 11, 1869.

Sherman's fifth examination.

"I seem to be in a very hot place: it seems tropical. I am where I saw those people with cat eyes. I see their four fingers again (1). It is the hottest place on this planet that I have seen (2).

"I am on the night-side now. How curious! I see northern lights, and lamps with reflectors, that show miles off, so that one can see very plain. You could read the finest writing by the light of those lamps five miles off. The people here are like us. The

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northern lights are very bright: they give a silvery light. The people seem to be out at night almost as much as in the day.

"The thing that I most admire is to see this world turn round, and the light going over the face of it. Where there are mountains, the stretched-out shadow gets shorter and shorter as it turns round. I seem now to be about five hundred miles off. Even here I can see the lights the people have, like little stars.

"I hear some singing in one room where they have one of those lights (3). They are earnestly engaged in singing. One man stands on a high place, and directs them. They have splendid tunes. After they have sung one song, he speaks; and they turn over their three-cornered books, and sing another piece. The musical marks are more curved than the word-marks. They do nothing but sing here.

"I see a place now where a man is lecturing to a crowded audience. They have round seats to sit on, without backs. He stands on a place a little higher than they are. The hall is about as large as Mechanics' Hall in Worcester."

VISIT TO A THEATRE.

("Look for a theatre.") "Oh, I never saw such splendor! There must be thirteen thousand people in this place. There is a stage made of that light metal; and there is something that resembles water so much, that you could not tell the difference unless you felt it. It moves too. It is made of pieces that are moved; and it looks just like water with a breeze blowing on it.

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"It is a representation of a cave by the water. There are stalactites and stalagmites in the cave, just as natural as life. They are made of this light metal too. There are hundreds of players.

"That is the funniest! They represent an animal under the water. You can see his form under this translucent" (he probably means transparent) "material. As it goes along it raises a dust, and that looks like roil coming up through the water.

"They dropped the curtain, and now it is a winter-scene. Some are skating on the ice, on broad, flat skates made of that light metal. It seems as if they were away off in the distance. It is done by pictures farther and farther off, and more and more gloomy. They are talking, acting, and laughing. It is something funny; for the audience laughs a good deal.

"Now it is the inside of a beautiful palace. There is a table; and a girl is getting something to eat, and singing away. A man seems to be chopping wood. I can hear him. She calls him, and he is coming. I never saw such a man. His beard comes down to his knees. They laugh now.

"Now they are pretending to eat. They have things made in pieces, and they pretend to cut them. They have a false mouth, connected with a bag, where they put what they pretend to eat. When I sit among the audience, it seems perfectly natural. They represent some of those fruits like large strawberries that I saw. They are talking all the time.

"The seats rise as they go back. They have splendid music. Their instruments are made of that light metal. I see one that is hollow and very thin.

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They strike it. There are about a hundred of them, of different sounds, like a chime of bells. They ring very much, and sound like one great instrument. They have some stringed instruments that look like banjos."

On questioning him after the examination, he said that there were two lights in the theatre, — one on the stage, and the other in the body of the building. The appearance of ripples on the surface of water was done by strips of material like glass, about an inch broad and a quarter of an inch thick, that were moved by machinery. Some of the actors wore dresses painted to represent leaves like the palm.

(1.) Sometimes he speaks of these people as having three fingers, and sometimes four; because, at times, he counts the thumb as a finger, and at other times counts the fingers without the thumb.

(2.) These people seem to live near the equator.

(3.) Though he does not say so, he had evidently returned to the planet.

WORSHIP ON MARS.

MAY 12, 1869.

Sherman's sixth examination.

"I see some boys playing ball. They have bats and balls made of something like rubber. They can make the ball go a great way. One boy hits the ball, and the others try to catch it. When one catches it, he hits it, and the others try to catch.

"I am now in a large palace, where there are about fifty figures of all kinds of men. The people are looking at them, and worshipping them (1). I hear them make a sound as if praying. They are in a hall about four hundred feet long, a hundred feet wide,

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and about fifty feet high. There is an instrument like a great organ, that makes a good deal of music. In the centre of the hall is one of those large lamps, that is very beautiful. The people are all dressed in white, with a gold fringe about their necks.

"The great musical instrument is filled with air, which passes out through whistles by pulling small handles that go slowly in after they are pulled out. The music is slow, but good.

"The statues are life-size, and painted to resemble men. There is a statue of a monkey-like animal holding on to a tree, and a statue of one of the best men by his side, to show, I suppose, how much man had advanced beyond the monkey. The statue of the monkey is covered with hair, fastened in when it was soft.

"The building in which they are is a splendid one. The people bowed down their heads, and seemed to be worshipping. A part of the time they sang and danced."

(1.) It seems unreasonable to suppose that beings as far advanced as they should worship statues; yet another psychometer formed a similar opinion with regard to them. Much of their apparent advancement may be owing to their proximity to a superior race.*

MACHINES FOR MAKING CLOTHES.

Sherman's seventh examination. MAY 17, 1869.

"The moon attracts me. I could go there very easily.

"I see a very curious animal. It has four legs, and

* See Mrs. Denton's examinations.

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a very thin neck, like a swan's or a snake's when its head is raised to strike.

"That has fled, and I am in a town or city. Everybody seems to be busy. The streets are very wide; and ropes are stretched across, and beautiful flags hang from them. They are all colors. I see pictures of a man on them, life-size, and beautifully painted. There are two hands, same as we have, pointing to two houses; and there are letters, but I cannot read them. They are something like Chinese letters.

"I see now what this man is for. It is for a sign. They make clothes here; and this man is dressed in their clothes.

"They have machines here that make the cloth and the clothes at the same time. They are made to resemble animals; and the teeth are made of long, sharp, smooth metal, thicker than telegraph wire. The thread is put in at the back, where there is a little door, and passes through the throat on to the teeth. The jaws go up and down, and that weaves it. It makes both legs, and then goes up and makes the arms, and all together as perfect as can be. After it is done, they cut it in two in the middle, put it in another machine, and turn over the edges. There is no seam in it. The machine lays them out on a table, and men pack them as fast as they are made. There are two or three hundred machines here.

"This animal chews up thread, and spits out clothes, like the juggler the other night, who chewed up tow, and spit out ribbon. It looks like a dragon or some great furious animal. It is about twelve feet long. For about two feet on the roof of its mouth, it is all

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teeth. As its jaws go, its eyes roll. It is painted to look very natural: you might almost think it was alive. It takes about ten or twelve minutes to make a whole suit. They have a machine to push the buttons in and fasten them, and another to make the holes. The thread is very much like catgut for smoothness; but it is not translucent.

"I think all the people wear clothes of that kind. Men come in and hand them little yellow, bright balls covered with impressions of heads (that is their money), and get clothes for them. They give one the size of a pea for a suit of clothes.

"I am glad to see that they use no tobacco here, neither smoking nor chewing. They have a nice, cool drink that is sweet. For a glass they pay a ball not much larger than a pin's head."

After the examination, in answer to questions, he said, —

"There was a man to every machine. When they were done, he sprinkled water on them, and handed them to another man. The power that made the jaws go went up the legs. You could hear it buzzing underneath the block the machine stood on."

FIREWORKS ON MARS.

MAY 20, 1869.

Sherman's eighth examination.

"The moon attracts me. I don't like to go there: it is too cold and desolate.

"I cannot see our moon, when I am there" (on Mars), "at all (1). I am on the night-side, and I see a light pass over the sky very rapidly. It is larger

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than our moon looks when full. It goes round Mars, and great multitudes are out looking at it. It seems very near. I cannot see any smooth outline to it. It seems like a fire, and sparkles. It flies round very fast. The people point their fingers to it. I can hear them halloo as it comes up. It seems to go round several times an hour. The temples and other high buildings are full of people looking at it. I never saw it before."

("What planet is that which looks so near?") "I see one planet that looks larger than any one does here. It looks as large as the door-knob (2).

"That light I saw is round, — a circle with points. It has no tail after it. It seems to be flaming. It gives a red light. I can hear the people shout away off as it gets in sight. I can see it on the day-side, but not so plain.

"It seems to go slower now. I should not wonder if it was some artificial thing. They have a telescope in a big building here; but they do not look at it.

"It goes very slow now.

"It dropped down like a stone; and I can see the light reflected into the sky. Why, it is nearly as big as this room, — fifty feet in circumference! It keeps sparkling; and people cannot get very near to it. It does not blaze, but seems to be melting down and running off. The people are round looking at it, and pushing sticks into it. Blue flames rise, curl round it, and vanish. It is nearly all melted (3).

"The people are going home, and lighting their lamps. I see nothing like rings or ear-rings on these people. They wear gloves that are made in the same

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way as their clothes; but they are made by a different kind of machine: it does not resemble an animal.

"They use steam there. I can see them use it where they make the gloves.

"They have a nice arrangement for washing. They have a box with paddles that strike the clothes every time. The clothes are stretchy when they are wet. They are very strong.

"They have very handy fireplaces. They carry the smoke down into water, and save it: it makes the water black, and keeps the air pure. They carry the thick material out for manure. They don't do that till the water gets thick. It keeps every thing very clean. They burn coal that smells very much of oil.

"The ceilings of the rooms are all ornamented with figures of many kinds, — birds, trees, and landscapes, — very beautiful. I see musical instruments that seem to be trumpets: they are made of gold or brass."

(1.) This seems to have surprised him; but, though the earth must be a conspicuous star from Mars, the moon, which is not much more than one-fiftieth part as large, would, to ordinary sight, be invisible.

(2.) This may be a satellite of Mars, too small to be seen by our telescopes.

(3.) This, from his description, appears to have been artificial. It may seem to be impossible upon our planet; but it does not follow that it would be so on Mars. It is only half the distance around Mars that it is around the earth; and the attractive force of the planet is only one-half that of the earth. With the great intelligence of the people, and their perfec-

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tion in the mechanic arts, they may be able to make a fire-ball travel in the upper region of their atmosphere with such velocity as to encompass their globe; though I do not suppose that it was done in the short space of time that he states.

BOOTMAKING ON MARS.

Sherman's ninth examination.

The following paper was written by Sherman on the 22d of May, 1869. Knowing that I should be absent on that evening, I requested him to see what he could, and write down a description of it.

"I saw machines for making boots. They are made of a kind of sap, which they get by boring holes in trees, and then boiling it down till it is quite thick: then they pour it into moulds. When it sets, it is like rubber. They take it out of the mould, and cut the inside out, and make it the right thickness with those machines. They put black material on, and polish them up, and make them beautiful. They can melt old ones over again.

"There are a great many machines for taking people about, that are worked by hand, and go very fast. Some have only one wheel, and some as many as six. They have springs on like carriages, so that they don't shake much as they go along the streets.

"They have a kind of lamp that is very safe. It has a sort of chimney that is all round the flame. It has no opening at the top, like our chimneys. It has no wick. There are four screws attached to little pipes that go down into some liquid like oil. The screws regulate the light. There are a great many holes underneath for air."

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RELIGIOUS BELIEF ON MARS INDICATED.

JUNE 3, 1869.

Sherman's tenth examination.

"They have an excellent way of melting things. They have a little candle made of black stuff like chocolate. Then they have a thing like a blow-pipe, with an elastic ball attached to it. They press it, and a stream of air goes out; but, as that goes out, more air comes in; and so it keeps blowing all the time. There are valves inside, some of which shut one way, and some the other. They can pick up a stone, and melt it right down (1).

"The man who is using it mends things in that way. He takes things that are broken, and heats them to melting; then puts them in a vice properly shaped, and squeezes them together, so that you cannot see where they are joined.

"I am in a large place now. It seems to be some kind of a theatre. Mercy! I think they must have religion there, and believe in some kind of a devil (2). I see a representation of a being with eight horns on his back, claws on his fingers about six inches long, and on his toes the same. The eyes stand out like lobster's eyes. The whole body is scaly and green. The teeth are about a foot long. There is a very large man inside. They have some people to represent angels, with imitation wings, sitting on stars, and held up by transparent cords. They look so natural! Some are represented as flying. The cords are moved above; and they slide along from one star to another, and make their wings go as if they were flying.

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"They have sinners there. The devil stamps on the floor, and then the sinners fall through flames into a place below; but they fall on soft stuff, so that it does not hurt them; and their dresses won't take fire.

"Now they pretend to have an army to kill this devil. They have a mortar, and blow its head off to the other side of the room; and it looks as if it was bleeding. The people shout and halloo. The soldiers are dressed very prettily. They have white feathers, and red hats with a blue band round them. They look as beautiful as light through a prism."

(1.) This was a blow-pipe of peculiar construction, and one that, it seems to me, would be quite useful to our mechanics.

(2.) If the highest embodiment of life on Mars is the human, and almost identical with that on our own globe, it is not unreasonable to suppose that the moral and religious development of the people there must have proceeded along similar lines to that of our own.

AUTOMATA, ETC., ON MARS.

JUNE 6, 1869.

Sherman's eleventh examination.

"I am in some great building, with statues that look so like life, that one can hardly tell the difference. The people are not here. The statues are fixed with wires, so that they walk, shake hands, and bow. There are seven or eight persons who take care of them. They are worked by machinery under the floor.

"They have a very curious thing here. It remains about two feet from the floor all the time, — just so

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high. As a compass turns to the north, and goes back when you push it to one side; so, when this is pushed down, it rises up; and, when it is pulled up, it sinks down again. Higher than two feet, it is heavy. It looks as light as pumice-stone. It weighs nothing where it stands. They slide it along. When they drop it, it bobs up and down till it settles in its place. They use it to measure in some way. The higher it is up, the more it weighs. There are several in this building. They are no larger than a thimble (1).

"I see almost everybody has one in his pocket. They are round as a marble, and glossy." ("See what they carry them for.") "I cannot see. They put them away very carefully. I think they measure heights with it by its weight."

(1.) With the diminished gravity of Mars, and the probably increased weight of its atmosphere, it is possible that a substance exists there whose specific gravity is less than that of the lowest stratum of the Martial atmosphere. In such a case, it would form a natural barometer.

THE FRUITS OF MARS.

JUNE 17, 1869.

Sherman's twelfth examination.

"I am in a beautiful garden, something like gardens here, but so splendid! What singular fruits! One is full of cells, like sponge; and it is nearly as large round as a bushel-basket: two of them grow on a stalk. The leaf is like an umbrella, but not more than a foot across. The fruit is like a strawberry

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outside. It is delicious, — something like pine-apple. It is light for the size of it.

" There are scaly fruits here like cones, as large as my head. They rip off the layer of scales to get to the white, hard part inside, which looks like a potato before it is cooked, but does not smell or taste like it.

" With what care men attend to the garden ! There is a bug they watch for. There is a bush about a foot high, on which there is a fruit like a cherry, — round, smooth, and glossy. About fifty grow in a cluster. Another kind is round, and the seeds can be seen inside. It is hairy and yellow. They rub the hairs off before they eat them. The seeds are beautiful, and shaded from red to blue.

" There is another kind of fruit that has a brown husk on the outside. It is round and nice-tasting, — something like banana.

" I see a splendid way they have to make one kind of fruit. There is a kind of liquid that they have in a bottle, into which they dip something like a brad-awl, and then stick it through the leaf. The hole grows up ; and then the spot commences to swell, and grows as large as an apple. They put salt on it, and eat the inside. The outside is hard. They punch every leaf on a tree. They squeeze the largest for the liquid to use over again. The leaf is thick, and rather leathery. The leaf *crimples* up ; and, by the time the fruit is ripe, the leaf is dead, and what was the stem of the leaf becomes the stem of the fruit (1).

" They graft there ; for I see a tree with six kinds of fruit on besides its own.

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"I see another thing. There is a large tree, with a thin bark like paper, that they strip off every year. They seem to use it for sick people. If they leave it on too long, it cracks, and comes off of itself.

"They have flying-machines to pick fruit off the trees. They have one that goes with the feet, so that they can pick with their hands. They guide it by pulling the branches.

"They have a fruit like our largest bell-pear, that grows on high trees. They boil these fruits, when they are hard, till they are cooked, and then cut them open, or they get soggy, and do not taste well." (The moon was shining into the room at the time; and he said, "That moon attracts me all the time. It pulls that side of my forehead.") "That seems such a nice way of picking fruit compared with ours!

"They have many roots, some no larger than beans, and some quite large. There is a mischievous bird that eats the large roots: it is especially fond of one that is round and like a radish. When there is a flock, they go after them with a flying-machine, and hit them with sticks. The roots are pulled up by the birds, which are not much larger than quails, but have large wings. Their yellow eyes look so curious!"

(1.) We have various insects that puncture leaves and twigs, and insert an irritating juice that causes them to swell, and produce what we call gall-nuts, oak-apples, fruit of Sodom, &c. This artificial practice on Mars probably began from an observance of a similar natural one.

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WINTER SPORTS ON MARS.

JUNE 29, 1869.

Sherman's thirteenth examination.

"I can see where it is winter. How they do love winter! They have sleds that almost make perpetual motion. They go down one hill, and nearly up another as high. They are the same shape at both ends. They have a thing that goes over ice and snow, with sails like a ship. I see boys, men, and women all out. They take special pains to make it icy. They have a pump on the top of a hill, and hire boys to pump water, so as to freeze, and cover it with ice. How smooth and glossy it is! They have a place to walk up. They have a kind of sled they can go up hill with. They work it with their arms. It has wheels, which they take off when they get to the top. It looks like a lame boy's carriage.

"There are suits made of steel, and jointed at the neck and legs, so that people can lie down and slide. They go like fury, — faster than any railroad-train. They go up with spikes in their shoes.

"I see a still better way. They have two hills made of light metal, with machinery underneath, that pushes one hill up, and lets the other one down. There are thousands sliding here. They pay those golden balls. I hear them talking, and see them making change. Only the men do it. One man shouts when all is ready. There is a place where they stop when they get to the bottom; then the hill rises, and they go down together."

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FRUIT-GROWING ON MARS.

JULY 12, 1869.

Sherman's fourteenth examination.

"I am in a house now. Why! they make improvements twice as fast as we do. I see a great deal better things than I did before (1). They have flies that bite, and they have things to kill them. They have windows with hinges at the bottom. They are let back by a rope over a pulley. They open the windows and let the insects in, and then have a gum-elastic bag that is stretched out as large as the room. Something in the inside attracts the insects; then they let the sides go together, and it kills every one.

"They have a splendid way to grow trees so that insects will not get to them. They put the dirt through sieves to get the stones out. Then they examine it carefully to see that there are no insects in it. They have great basins of wood like wooden bowls, as much as twelve feet across. They set them in the ground, and set the trees in them. On the edge of the bowl, all round, wire is placed, and drawn over the tree so as to make a wire net. Then there are little doors, so that the people can go in and out. The leaves on the trees are nearly all perfect; and the fruit grows full size, and gets ripe. No gnarly fruit there. The wire is very fine. I do not believe an ant could get through it.

"They have a good way of killing plants they don't want. They use a white powder that looks like flour, which they sprinkle on them, and they die down.

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They die even when it comes within two inches of them.

"They have an excellent way of making soil. I see them crushing mud and sand between wooden rollers attached to a water-wheel, that reduces them to powder, just right for putting on their plants. All the leaves on the trees have the same chance, and all the fruits; so that they are nearly all ripe at the same time.

"They are very careful not to bruise the fruit. They put something like cotton into all the baskets, and round all the fruits, so that they don't touch each other. They have a long forked pole to lift them off the trees. They spread soft stuff on the ground, so that they will not be injured when they fall.

"They keep fruit all winter in large vessels made of iron, very thick. After they suck the air out with machines, they are bent in, thick as they are. The vessels hold four or five bushels. It is a little thing on the top that sucks the air out, and stops when it is done. It goes up and down like a small walking-beam of a steamboat. I can hear it go, and the air come out. They carry the vessels more carefully after this is done (2).

"They have a large white fruit, nearly as white as snow, and as large round as the top of a peck-measure. It is delicious. There is yellow and pink inside; but it is perfectly white outside. They are very particular about growing and preserving this.

"They have a small fruit, about as large as a huckleberry, that grows in great abundance; and they pick them with a machine that does not damage the

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leaf. There are two handles to it; and it works so that the air draws the fruit off, and the leaves stay on."

(1.) As he did not observe them before, he seems to have supposed that they did not exist.

(2.) It does not seem improbable that fruit could be kept fresh considerably longer if placed in stout vessels, and the air exhausted.

UTILIZING ELECTRICITY ON MARS.

JULY 23, 1869.

Sherman's fifteenth examination.

"I see many kinds of animals that they have caged near a river. They have one that is a good worker. They belong to certain districts. There are about three hundred in this district, and any man can use them that needs; but he cannot get them out of his district. The animal is about twice as large as a horse. They have more than are needed at one time.

"They have a good way of killing weeds. They have a thin knife about ten feet long, and ten feet wide. It is made to go under the plants, and cut them in two, a little below the surface; and then they die. They use that animal to make it go. They have small ones.

"Oh! almost every man has a place in his house for the lightning to strike. It goes up about twice as high as his house. It is made of iron, is hollow, and has a wheel at the bottom, which turns when the lightning strikes it.

"I declare! I don't see how they do this; but they keep the electricity in some way, and it shoots up

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from the top of this conductor like a large ball. It seems as if they made some use of it. There is machinery inside of the conductor, and it is ornamented so as to look beautiful. I can see cog-wheels and bands. It is all fixed in a mechanical way. Those balls shoot up so far, one can barely see them.

"The conductor keeps drawing the lightning down out of the clouds. Sometimes ten or eleven discharges follow each other about a minute apart. Almost always one or two sparks fly out before the discharge. It jars the ground when it strikes."

LOCOMOTION AND BATHING ON MARS.

AUG. 19, 1869.

Sherman's sixteenth examination.

It was cloudy; but he found little difficulty, as he said, in passing through the clouds and to the planet.

"Oh! I am where those people are that have cross-eyes like cats' eyes, and that have three fingers and a thumb. I see many new things here. They have soft clothes. They are very honest people.

"They have hats made of green stuff, as large as umbrellas; so that they walk in the shade all the time. When it rains, they can just sit down and let the rain run off. They have the same kind of money as the people on the other side, — those I saw before.

"I see a machine the people have for riding around. It is so easy! It is no expense at all. They wind them up with a machine. They work with both hands. Then they get in and touch a spring, and go for an hour (1). They can steer it very easily. A great many can ride in one. I see as many as two hundred

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in one. The car is near the wheels. They come up inside the car. The road is laid with stones, smooth. The wheel is rounded, and the car is very light. It is made of that light metal. There are small ones that carry one or two. They go as fast as a freight-train. The man that steers winds them up. How quickly they turn!

"Every ten days they have great picnics. Every tenth day is like our Sunday; only they make it a day of pleasure. They have great times.

"Their hats look so curious! They stick to their heads like wet leather to a stone, and the wind cannot blow them off. Both men and women wear pants. I think the women look a great deal better there than they do here. You could lift a man up by the two sides of his hat. They lift them up at the front when they want to take them off.

"These people have curious things for learning to swim with. Everybody learns, and swims. When learning, they have flat boards they lie on, that are buckled round them, just sufficient to keep them up. They have regular swimming picnics. They are a very healthy people.

"They have things, also made of wire, just so deep, fixed with pulleys, so that they can lower them into the deep water to the right depth for the little fellows to swim in. They have things on their hands too,— heavy things to practise with; and then they can do better when they are off.

"There are men wading on stilts eight feet high: and, just at the water-level, there are flat things; so that they look as if they were walking on the water.

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They dive with them on too. This water is salt. There are great seaweeds in it. They dive down for pebbles and other things just for their beauty.

"I see poles stuck in the mud, with troughs on top, in which the learners can lie and practise just under the water.

"Some women swim splendidly. They go away out. They do not wear any bathing-dresses. Men and women all bathe together. They look like the people here, — all but their eyes and fingers and toes.

"Some of them have hollow things belted round them, thick in front, and thinning out to the back.

"The water is very warm. The air has a temperature of eighty-three degrees, and the water about sixty-six degrees. The sun is shining."

(1.) The winding-up was probably connected with some apparatus that he did not see for generating the power that propelled the machine. It would require a steam-engine to wind up a spring that could move a car with a load of two hundred persons in it, even if they weighed no more than they would on Mars.

HOUSE-BUILDING ON MARS.

AUG. 20, 1869.

Sherman's seventeenth examination.

It was cloudy again to-night.

"I see the same people working very hard. They use those travelling-machines to carry lumber and things generally.

"They are making things. They have such curious tools! They even bore large holes at the bottom of small ones in that soft metal. They do it with a

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spring in a drill. When the hole is so deep, they touch a spring that lets the cutter out, and it makes a larger hole. When they want to get the drill out, they pull a piece out of the centre, and out it comes. They have these drills of all sizes.

"They make their houses in a very curious way. They do not make them with a frame like ours. I see a house now that they are building. It has eight corners. They first put up a solid pillar of that light metal in the centre, as high as they intend the house to go; and from it they fasten on others: and they reach across on each side, so as to make ribs to eight corners; and they make the sides from those corners. Below, it is all framed with this light metal, and finished on the outside with sheets of the metal, that last a long time. They can make and finish a splendid house in a week (1).

"It is nearly all made of this metal. On the ground is a frame, and pillars from each corner down to this, and fastened. The walls of the rooms are made of that metal, and polished. It is very beautiful, and looks like agate (2).

"They have very nice material for warm weather. Clothes made of it cannot be heated. It is always cool. It looks glossy, and is as soft as silk. It cannot be burned, and it puts out fire when it is put upon it."

(1). He probably meant that they could put it together in a week, the material being all prepared beforehand.

(2.) Such a house as he describes could neither be blown down, thrown down, nor burned down; and, in earthquake regions, would be invaluable.

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BEASTS OF BURDEN ON MARS.

Sherman's eighteenth examination.

The following paper was written out by Sherman in August, I think; but the date was not attached to it.

"I am in a beautiful city, where everybody seems busy.

"Now I am where the flying-machines are.

"There are animals here like elephants; only they have no trunks. There are a great many kinds of trees, and some like the palm. These animals are very gentle, though they do not look so. The people use them for taking them about. They feed on the fruit of this palm, and live near the water. They are used instead of horses. On some of them there are beautiful fixtures to ride in.

"There are large telescopes here, so good that the people can see a man in our world. They are looking at our velocipedes, and laughing."

In answer to questions, he said that the telescope was small at one end, but large enough to see with both eyes; and, at the other end, as large as a room. It was two or three hundred feet long. Inside of it there were very clear glasses. It was placed on a large tower.

SILK-WORMS ON MARS.

SEPT. 12, 1869.

Sherman's nineteenth examination.

"I am in a place where the people are making something that will burn, and give light for a great

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while. It is something that they get out of the ground. A piece an inch long will burn for an hour.

"They have a kind of worm here that they kill before it spins, and then put the inside into a sort of machine, and draw it out into a kind of thread. The worm is about six inches long.

"Some of the silk is blue; and some looks clear, like catgut. I think one is from the male, and the other from the female. That thread is what the clothes are made of that I saw spun by machinery the other night.

"At a certain size they give the worms no more to eat; and they turn black, and die. The skin peels off when it gets hard and crusty. The inside looks very pretty. They unite a great many together, and make very long threads (1).

"The worm feeds on a leaf about the size of a broad-brimmed Panama, that grows on a high bush.

"They let a few spin cocoons to raise eggs. The cocoons are a very long oval. The same moth lays eggs that produce both kinds. They can take the blue color out."

(1.) Out of the common silk-worm of our planet, there is, I find, a material produced, called silk-worm-gut, used by anglers for dressing the hook-end of the fishing-line, and also made into violin-strings. When the worms are about to spin, they are immersed for about twelve hours in strong vinegar. The operator then lays hold of one end of the silky material which is seen in the silk-glands, attaches it to the edge of a board, and stretches the material till

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the other end reaches the other edge of the board, where it is attached, and then left to dry.*

EXAMINATIONS OF MARS BY ANNE DENTON CRIDGE.

Being very desirous of testing these wonderful statements by independent examinations, early in May, 1869, I wrote to Washington, requesting my sister, Mrs. Cridge, to examine Mars, and let me know the result. I received a letter a few days afterwards from Mr. Cridge, stating that an astronomical friend had pointed out the planet, and that Mrs. Cridge would commence the examination as soon as the weather was warm enough to enable her to be "entirely negative, and not shiver." Nothing was written with regard to what Sherman had seen, so that the experiment might be a test one.

The examinations were not made till July. I give them just as they came to me, written by my brother-in-law at the time they were made, with the exception of the headings and a very few verbal corrections. No thought has been changed or left out, and nothing added.

THE LIGHT OF MARS.

JULY 20, 1869.

Mrs. Cridge's first examination.

"Now I can see Mars as distinctly with my eyes closed as when they are open. There is a peculiar sensation, as if I moved to the planet, or the planet came nearer to me.

* Chambers's Encyclopædia, art. "Silkworm-Gut."

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"For an instant, — only for an instant, — I feel myself face to face with the planet; yet it appears no larger than it does to the naked eye. That sensation is gone; and, as quick as a flash of lightning, I find myself hovering in space. I look up, and, lo! a world on my left and on my right. Encircling this world is a ruddy atmosphere. How still it is! I look up at the clouds, and wonder as to the cause of the rosy hue. The very air is impregnated with the causes from which are eliminated the hues of the rosy curtain which envelops this world. It is entirely unlike any thing I have ever seen, except the peculiar light which is sometimes seen of a summer evening, when the western sky is lighted up with red, and the very light appears red and soft to the eye; for about the atmosphere of Mars there is a peculiar softness in regard to the transmission of light.

"As I observe this peculiarity of the atmosphere, I notice that the planet is moving around its axis. I catch the outlines of the land and water; but I am so interested in this atmospheric peculiarity, that I would like to become satisfied as to its cause. One cause, I think (though I may hereafter find, when I come to analyze the planet itself, that I am mistaken), is a peculiarity of the matter composing the globe of Mars; for I find here, as I rest between the globe and its envelope, that there is a chemical action constantly going on between the light which comes through its atmosphere and the matter of which the planet itself is composed.

"I feel like an infant born into a world of which he knows nothing; for here are causes at work con-

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cerning the adjustment of which I am entirely ignorant. Now I look more closely into the nature of this atmospheric peculiarity, and realize the beautiful play of an electrical agent. The sensation derived is one of vigor and elasticity. There is a feeling of life-giving power that I have never experienced from the atmosphere of our earth.

"And all this is to me so new and wonderful, that I find myself speculating and philosophizing; and so the psychometric condition is broken."

THE ATMOSPHERE OF MARS.

JULY, 1869.

Mrs. Cridge's second examination.

"The character of the atmosphere is to me so wonderful, and I find myself so interested in ascertaining its nature, that I am held, as it were, within it.

"There is a peculiar sensation of *life* in this atmosphere, — a life-giving agency.

"I perceive that the particles which give this peculiar tint to the light are globular and rosy, having the appearance of lightning, and electrical in their character. They are in motion, alternately attracted to and thrown off from the planet to and fro, yet not so disturbing the atmosphere as to make this motion perceptible to the *physical* senses, were we there bodily. I realize this state of things psychometrically. The other ingredients of the atmosphere of Mars are colorless, like those of our own.

"Though the atmosphere is denser, heavier, than that of the earth, it has more life in it, and is remarkably clear.

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"Psychometrically I am impressed, that, at one period, the planet itself reached the limits of its present atmosphere; and I feel clearly that the atmosphere has been *born of the planet*, and is a part of it, its peculiarities belonging to the planet as a base. The light of the sun comes there in contact with different gases, natural forces, and conditions, from what it does here: hence the atmospheric result.

"If there be any inhabitants on this planet, I think that they must, by reason of their superior atmosphere, enjoy life much more than we do. There is a sense of travelling through a strange land in journeying through this atmosphere, and one feels curious to know what kind of a country it can be; but it is impossible to speculate. I long to set foot on the soil."

PHYSICAL GEOGRAPHY OF MARS.

JULY 27, 1869.

Mrs. Cridge's third examination.

"At last I am on the planet. I find myself on a very high mountain, volcanic in origin, which ascends miles into the atmosphere. I thought that probably the foliage would be red, and that I should find red everywhere; but, on looking down into the valleys, I realize greenness and blueness, as well as the ever-pervading redness in the atmosphere.

"I want to look at the rock under my feet of which this mountain is composed. How high this mountain is! I could never get down were I in such a place. I want to psychometrize the rock. I realize the sphere of iron, but not much of it. There are also precious metals, but not in large quantities: what there

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are are closely incorporated with the rock. To the eye the rock appears like crystallized quartz.

"What a queer world this is! What immensely high mountains! What valleys! Between the point on which I stand, and another mountain to the west, sleeps one of the most undisturbed valleys of which the imagination ever dreamed. And the shrubbery, — there is vegetation — is green. From the point whereon I stand, the greater part of it is dark green in color; but away over yonder, north by west, where the sun is shining, it is light green; still farther north, there is a bluish appearance like water. I want to go north." (A pause.)

"Now I come back again to the mountains. I would like to go to the pole, but cannot travel that distance to-night. What tufty trees, — baby trees! What strange and curious forms! What does it mean? What are they? They look like large mushrooms, thick stalks, as large as the trunks of our ordinary-sized trees. There is, however, an approach to the leafy form about them in the direction of the veins; so that, at a distance, they have the appearance of trees. There are quantities of low vegetation, which, at a casual glance, resembles moss; but how very dense the undergrowth! Should I step on it with my physical feet, I should, it appears to me, become buried in the mass, living and decayed.

"Though the atmosphere is so dense, yet there is such a sensation of elasticity, that, could I be transported bodily to the planet, I should find motion so easy and rapid, that I could imagine myself to move in the air by will-power. My body has the sense of

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flying. I have the sense of being there bodily, and I feel as if floating with a kind of wavy motion. The attraction of gravitation is not nearly as great as on the earth.

"I had a passing impression of inhabitants, who were, I think, chunky, and short in stature. I took, however, no particular notice, being mainly interested in the *natural* characteristics of the planet."

PHYSICAL GEOGRAPHY OF MARS CONTINUED.

AUG. 1, 1869.

Mrs. Cridge's fourth examination.

"I look from the same point as before, — a very high peak; and, as I look across to the twin-mountain before mentioned, I perceive it to be so distant, that it appears like looking from the extreme verge of one continent on one side to the extreme verge of the continent on the opposite side.

"There is the valley, — the deep, deep, dark-green valley, — in much the same shadow as when I last saw it. The sun, however, reaches in it a little farther to the southward, glancing in from the westward; and far away to the north and west is the break before mentioned, where I catch an outline of water or snow.

"As I rest here to-night on this mountain, I feel a thousand influences, and I am drawn in as many directions." (A long pause.)

"I find myself standing on the shore of an ocean; and the water ebbs and flows. I put my hand in the water. It is of aqueous character, but not like our water. It makes a curious noise as it rolls to the shore. It does not break and splash like ours. It has

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within itself a peculiarity that attracts it to the planet, — a sort of adhesiveness, or perhaps electrical attraction to the body of the planet. It is more buoyant, can sustain a greater weight, than ours. It is transparent, and has a peculiar sparkling appearance when lifted up and held before the light. I observe, too, that it is greatly charged with similar globules to those that are in the atmosphere. They are electrical.

"Oh, I want to notice, examine, and analyze so many things! I want to psychometrize the water, and ascertain the materials of its composition, and wherein they differ from our water. I should like to look down through the earth on which I stand, and the ground over which the ocean rolls. I should like to analyze the imponderables in all these. And with all this there comes a sense of weariness from the realization of a new world and new surroundings.

"The shore or point on which I stand is south-westerly from both these high mountains, on one of which I stood. I *see* no inhabitants, though I know there are some; but I am more attracted to inanimate nature.

"There is ice in this world. I see it in that break which I mentioned as having seen from the mountain, and which is northerly from the mountain. I catch a glimpse of this ice, and see it extending over the waters as it freezes."

REPTILES ON MARS.

AUG. 8, 1869.

Mrs. Cridge's fifth examination.

"I stand on the same mountain as before, but not so far up. I have looked so often into the valley that

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lies away down, — down in such perilous depths, — that whereas, at first, every thing appeared indistinct and shapeless, I am now enabled to examine things more calmly. I do not feel in a hurry to-night.

"I catch a glimpse of huge reptiles in the valley, crawling amid the dense underbrush and accumulations of decayed vegetables that lie in immense depths. A stream of water runs through this valley; but it is so concealed by this *débris* and underwood, and it is so dark-looking down there (for the sun never shines in it), that it is no wonder I did not observe the stream when I came first.

"I feel as if I were two individualities almost, one of which stands some distance down from the high peak from which I looked first; while there is another self — a consciousness — that goes down into the valley, like a psychometric power within a psychometric power. And so I climb up the immense *wall* which bounds the valley on this side.

"I see mosses and vegetation; but I cannot stop long enough to observe them in detail. In a similar manner, I also catch glimpses of huge animals resembling crocodiles or alligators. I only see their heads occasionally. I don't know what they are like in regard to the details of anatomical construction, or the class of animals to which they appertain; but they look huge and monstrous.

"This peculiar element, — gas, or whatever it may be, — that imparts the peculiar ruddiness to the atmosphere, I find not only in the atmosphere itself, but in all water: and, indeed, it seems to be a component part of almost every thing there, so far as I have gone;

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being as necessary to the planet and all its appurtenances as our air and water are to the earth and its inhabitants. It is correlated with every thing, forms a counterbalance to the seeming lack of attractive force in the planet itself, linking all things together, so that every thing is held by this element.

"On the present occasion, as also on the last, I caught a glimpse of the other hemisphere of the planet, now turned from the earth. It is a beautiful region, apparently well adapted to human habitation."

PECULIAR ELECTRIC CONDITION OF MARS.

AUG. 10, 1869.

Mrs. Cridge's sixth examination.

"I look to-night on the south-east side of the mountain. Down, down, down it descends, in a south-south-east direction, until a body of water reaches to the land, of which the mountain forms a part. This water is a very large body: it extends for a long distance east and west; reaching also to the south pole, and all around it, except at one part, where it is broken by a group of islands; which group, at one period, was united and linked with that continent, of which the deep, dark valley forms a part.

"I see the indentations which the water has made on the land as it fringes the shore. This part of Mars is very pretty: it appears exceedingly pretty. From this high point of rock I can scan the whole. How small it seems! How small the whole globe seems! — such a short distance from pole to pole! It is warmer than I expected to find it, the red appearance (or the cause of it) giving warmth as well as light. And

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though, there as here, the climate varies according to latitude, it is much warmer than its distance from the sun would lead us to suppose. It has within itself an electric battery, as it were, which, by its pulsations, causes a peculiar electrical condition of the whole planet, inducing warmth, as well as the peculiarity of redness in the atmosphere.

"To the north of the *eastern* continent (considering the mountain, deep valley, &c., as being a portion of the *western*) I see a volcano. It is smoking now. It is night on this (eastern) side.

"This planet has been subjected to excessive volcanic action. There are evidences of volcanoes in thousands of places, as if the whole planet — on this (eastern) side especially — had boiled at some time, and thrown up small craters. From a distance, they have the appearance of so many pyramids. The material which has been thrown out (lava) is now of a whitish-yellow color. They have been active at a period comparatively recent, speaking geologically.

"The land of this eastern continent is peculiar in its form. Regarding it from the high mountain, it is low at first on the southern shore, and rises gradually to the north and east in the form of an amphitheatre. There are fine rolling hills and plateaus, with thousands of those projections, or craters, forming a sort of ring, or border, around the amphitheatre. They are so white, and so similar in appearance, that they form a very curious and pretty background to the picture. They stand like so many sentinels, guarding the beautifully-undulating valley below.

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"But still farther eastward, and beyond all this, I catch the outline of a beautiful country. I see vegetation, trees, — oh, so dense!

"Thus I linger with inanimate nature, though I would like to reach down to the animated portion.

"There is a peculiar sense of the smallness of this planet. I think that its specific gravity must be less than that of the earth.* I am very confident that it is older; though I cannot tell *why* I think so, further than that something in its nature gives me that impression. There are less metals, proportionally, in Mars, than on the earth. The rocks, generally, are lighter and more porous; and in the very centre there are immense cavities, giving it something of the character of a bubble, but not much. It is not, however, solid or fluid throughout. There have been consuming fires within that have burned themselves out."

A PUBLIC PARK ON MARS.

AUG. 17, 1869.

Mrs. Cridge's seventh examination.

"Now I see the eastern continent just as before. The darkness clears off slowly; and I stand on what is like public ground, laid out somewhat labyrinthical. In the centre is a very large vase, carved out of stone, ornamented on the outside, in high relief, with what, in the lower portion of the vase, resembles cactus-stems, curving outward and upward, and terminating in animal heads. The centre of the vase is filled with earth.

* In the proportion of 95 to 100. — A. C.

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"This place, I see, is intended for a public garden, or park; but it does not at present fulfil that use, as it is winter in this portion of the planet. I see the trees in this park, but only the outlines, as there is no foliage."

(At this point there was an interruption of some minutes from external causes.)

"I see a beautiful city. It is laid out in *triangles*, two of them forming a square. Some of the triangles are entirely occupied by one large building; others by a number of houses.

"The sphere of every thing here is very pure. The people are very neat and clean. They are somewhat short in stature. Walking is performed by them with the greatest ease.

"All this is very dimly seen."

THE PEOPLE OF MARS.

AUG. 19, 1869.

Mrs. Cridge's eighth examination.

"I am again in the city mentioned in my last examination. I see the people sitting at the doors of their houses. There are rich and poor in this city. I examine the individuals. At first sight, they appear to be of the same race as ourselves. They wear clothing, eat, live in houses, &c.; but, on a further examination, marked differences are perceived. The pale color of our skin gives place, in them, to a most beautiful *pink*. Their hair varies in color from black, through various shades, to red; the latter color, however, being the most common by far. They have not only a circulation like ours, but, in addition, an

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electrical circulation, focalizing in that part of the brain which lies between the organs of firmness and veneration. Their heads are high, and, I think, superior to the average Caucasian head in the development of the intellectual, moral, and spiritual organs. I need, however, to make further examinations before I can be certain on this point. There is, however, in their minds, a decided outlook towards a Supreme Being. Their philosophy, as well as their intuitional faculties, points in that direction. I think they have more spirituality than we have.

"Our hair is electrical, but theirs is very much more so. We should be astonished could we feel with our physical senses the amount of electricity which it contains. Their will, like ours, operates on their muscles in order to produce motion; but their will further acts simultaneously on that *electrical* circulation which I have mentioned, whereby their motions are greatly facilitated. This, in connection with the much-diminished attraction of gravitation on that planet, renders walking so easy and delightful, as to seem like floating in the air as compared with ours. They walk and run in the same manner as we do, with the preceding difference as to the amount of exertion required, &c.; but they have, in connection with this lightness and electric force, a species of locomotion which is to us entirely unknown. It is a power by which, merely touching the earth with their feet from time to time, they acquire an undulatory or wave-like motion, which sends them to a considerable distance, in wave-like curves, from one point to another. On again touching the earth with their feet,

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the motion is repeated. This method of locomotion is to them very delightful, and much practised. It requires more muscular exertion, however, than their walking. They get up excursions, in which this method of half flying, as it may be considered, is practised by numbers of persons in company. One of the first signs of old age is the diminution, followed by loss, of this power. Afterwards the sense of lightness in walking is also diminished.

"How like logs we should seem to them! — so bound to the earth!

"They have learned to make glass. I see a large circular dome of glass, of very great height, in which are grown numbers of beautiful plants and trees. It is in the centre of a large piece of ground, which is, apparently, a botanical or public garden. In this garden are also numerous trees and plants.

"In the south-western portion of the Western hemisphere, approaching in that direction to the verge of the Eastern, on a large tongue of land jutting out into the sea, — something like Southern Africa, but smaller, in the southern hemisphere, but not near the south pole,* — I see a race of men who are almost black, their bodies nearly covered with dark hair. They are very small in stature; and their heads are small, even in proportion to their small bodies. They do not live in houses. They are the most inferior race of human beings I have yet seen.

* See Secchi Continent, — map of Mars, p. 266.

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THE DWELLINGS ON MARS.

AUG. 27, 1869.

Mrs. Cridge's ninth examination.

"I am in the suburbs of the city I have previously visited. I see some animals at a distance that are of a beautiful cream-color, the head resembling that of a camel. They are on a hill.

"It is not a large city, but beautifully intermixed with the country. The ground just here where I stand being somewhat higher than some portion of the city; I have a rather general view of it. I have seen no architectural work on the earth that equals that of those houses: they appear like dense vegetation assuming the form of houses Near to where I stand are three or four dwellings or cottages surrounded by gardens." (A long pause.)

"Those dwellings are covered by creeping, tasselling, clustering vines, with here and there branches of trees just visible among the profusion. I once in the United States saw something, the roots of which had been brought from Europe, which hung in tasselly clusters. Among these vines I see something of that appearance; only these are more definite and richer. Sculpture is poor and coarse in comparison with them" (A long pause.)

"I have been admiring with astonishment those cottages. I think, however, that, notwithstanding the *form* of foliage, the material is stone; and it has not been carved or hewn in these vegetable forms, but is the result of some subtle agency of Nature, the character of which I am at present unable to state.

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"Those cottages have glass windows, which project something as windows do in French roofs; but the glass portion comes to a point at the top, and is rounded below and at the sides, as if a pear were bisected longitudinally. The external appearance of the windows is very pretty. There is but *one* story.

"Their fences are composed of the same material as those vine-like appearances which I have described. In form they remind one of branches of trees covered with moss and other parasitical vegetation: yet, even in the most delicate portions, the material is hard; and they are all of tints varying in color as the rocks vary with us. I notice drabs, browns, and lead-color in various shades, quiet colors predominating.

"Now I find myself in the heart of the city, if that can be so called which seems all like a beautiful country. In one of the triangular divisions which I have mentioned in a previous visit is a large mansion of *two* stories, the first of which stands out several feet beyond the second, leaving on the top a kind of terrace. The first story is very lofty. There are many of those peculiarly-shaped windows, both above and below. On the top of the house is what may be termed a cupola, for want of a better name. It is supported by pillars, but is much larger in proportion to the building than cupolas are on the earth. It forms a beautiful addition to the building, and is more a *part* of it than the word "cupola" indicates. Looking at the building from the surface of the ground, the upper portion has a very fine appearance, being so large, and yet in harmony with the story below, giving a terrace-like appearance to the latter.

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"The building is polygonal in ground-plan. I do not know *how many* sides, — probably eight or more; but I have not seen it all around so as to count the sides, which, however, appear to be all of equal size. On each side are two bulged walls, each formed of *eight* equal sides, instead of being circular or curved. In those bulged portions are the windows, above and below. I should like to go around the building; but I cannot. I see, however, that it is polygonal.

"So much for the form: now for the material.

"As I stand here regarding it, delighted at its marvellous beauty, I observe that it is composed of the same material as those suburban cottages: but, though they were quite pretty, I realize, by comparing them with this building, that they would merely represent *uncultivated* taste; while this, in every particular, expresses the fine stand most delicate culture. The whole building is adorned by something in the *form* of vegetation, arranged in the most perfect expression of ideality, — trailing vines, cup-like flowers, the small, the delicate, the exquisite, duly combined with the larger and bolder. And yet, when touched, I feel that it is all hard, like stone. I go to the cupola; but, when here, it reminds me of a most exquisite summer-house covered with trailing vines; and, when I look up to its inner roof, I find it to be formed of one large, beautiful leaf, surrounded by vines and flowers. Yet *all is stone*, having all the quiet, delicate variety of coloring that the rocks have; browns, lead-color, drabs, &c., predominating. It is as if Nature had here elaborated in stone all that on the earth she has elaborated in vegetation; in short, had immortalized herself in petrifactions.

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"Though I do not distinctly see the people, I can psychometrize the eye, in the pupil of which is a peculiarity due principally to the electrical circulation in themselves and to the atmospheric conditions before mentioned. It is this: The pupil is formed of a *many-sided lens*, enabling them to see more from the *side* than we can, and giving to the eye a pleasing expression. I am unable to describe this more minutely for want of sufficient optical knowledge, as well as from insufficient opportunity to examine further.

"The convolutions of their brains are also very different from ours. Their brain is divided into six compartments, the two posterior being partially united. I need, however, to make a more detailed examination in order to convey a clear idea. They have senses like ours; but an electrical sense is super-added, — something recognized by them as a part of themselves more than is the electrical element with us.

"Now I look into a building where there is machinery in operation, electricity being the motive-power. How smoothly and silently it moves, just like the operations of Nature!"

INTERIOR OF THE DWELLINGS ON MARS.

AUG. 27, 1869.

Mrs. Cridge's tenth examination.

"I am now inside of the large house, the outside of which I described in my last.

"The walls are of extraordinary beauty, being inlaid with pearl and a variety of beautiful colors, and highly polished. Here and there are large mirrors,

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the spaces between which are covered with this exquisite and intricate work, which is perfectly smooth, being inlaid in the wall itself. Where our walls would be bare, they are here covered with this inlaid work, which resembles beautiful flowers, purple and green predominating. I never saw any thing so perfectly beautiful.

"I am in a large room on the south side of the house; and on the west side of the room is a large mirror, reaching almost to the top, on each side of which are white pillars resembling the finest alabaster. At the top the mirror is let into the wall several inches. On each side of it, near the top, is a representation of a beautiful bird, the predominant colors of which are purple and gold. Each bird holds in its mouth grains made of gold.

"There are several mirrors here, some of which are larger than this one; but, for some reason unknown, I am attracted to this one.

"As I stand, I see the reflection of myself in the mirror. The windows are open, and reach to the ground. Instead of lace curtains, they are adorned by resemblances of vines and other plants, interlaced, and drooping about the windows. The material of which they are formed is similar to that composing the birds and the inlaid ornaments between the mirrors: it is not, however, of the same nature as that composing the stony *exterior* ornaments, but is *manufactured*, the ornaments being of the most exquisite workmanship.

"The interior arrangements of the building enable several of those magnificent rooms to be thrown, when

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required, into one apartment. The walls, which may be considered as double, then are made to form pillars. They do not, however, convey any impression of massiveness, being so very light, owing to the diminished action of gravity in this planet as compared with ours, and from the adaptation of all matter to that condition; also, still more, owing to the superabundance of electricity.

"Of the people I occasionally catch glimpses; but I am not yet in the condition for *human* psychometry, feeling more linked with the inanimate. I hear the people talking: I hear the sounds, but know not the language. They write; and the written characters are very peculiar.

"Now I am in the garden. I see a small body of water, which may be a pond or artificial lake. It appears heavier than our water. I cannot more particularly describe it. I now see only *parts* of things."

(At this point the planet had almost set, and was nearly invisible.)

BUILDING-MATERIAL ON MARS.

SEPT. 10, 1869.

Mrs. Cridge's eleventh examination.

"I am again in the outskirts of that city. I see there broad roads and hedges; and, in the city, streets and sidewalks.

"They ride in vehicles. I see one that is double-seated; the back seat being much higher than the front, giving it a curious and rather pretty appearance. Those vehicles are drawn by animals.

"In this city they have sewers and water-pipes.

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And now I see that their water and ours is composed of the same gaseous elements; but theirs has an additional ingredient.

"This and other things I perceived before, but only dimly, as I can imagine an infant may at first see things, — vaguely, and in snatches. But now I feel more accustomed to the light and the atmosphere, though there is not yet all the distinctness that I could wish.

"The foliated stone, which I have before described as ornamenting the buildings, is *manufactured* very easily and very rapidly. The rock, which is the raw material, is first brought into a fluid condition, and then, by mechanical agency, forced into moulds, and removed as fast as it cools. I can see them at work making it. In one part of the building I see the rock in a fluid condition; yet I do not see distinctly; or, rather, I see distinctly *that at which I am now looking*, but all outside is shut out in darkness: the *field of view* is narrow. I visit places, or *portions* of places, as we might visit places here, seeing only that at which we are intently looking. I see, too, only with untutored eyes, as one might see, if, being ignorant of the nature of machinery or the principles of mechanical construction, he should go into a machine-shop, and observe the operations there in progress.

"I saw the fluid rock pass through openings in a partition or wall, and into moulds, which were suddenly cooled by a bath of water. A number of men were at work removing the material from the moulds as rapidly as it cooled; and so exactly was the machinery constructed, that, with the precision of the

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pendulum, the material was placed in the moulds, the moulds opened, and the castings transferred to long, broad, shelf-like receivers. The whole motive-power is electricity, and comes from an apparatus not larger than a blacksmith's bellows; and the electricity therein generated is introduced into the rock by means of iron or steel pipes welded together; and I see numerous apertures by which the electricity, as separated from the air, is introduced.

"There are here poor and rich, workers and drones: there is, too, an inferior class, or race. I cannot tell *how* I know this; but I *do* know it."

DIFFERENCE BETWEEN THE PEOPLE OF MARS AND THOSE OF THE EARTH.

SEPT. 13, 1869.

Mrs. Cridge's twelfth examination.

"The countenance of those people about the lower part of the face is dish-shaped. The iris of the eye seems to have six points, and presents the appearance of a many-sided lens. The expression of the face and its curves harmonizes with the expression of the eye, giving a bright, animated appearance to the countenance. The eye is better adapted to the peculiar atmosphere of the planet than our eyes would be, to which the highly electrical atmosphere of Mars would be very painful, and would soon produce blindness; while the inhabitants of Mars, if here, would scarcely be able to see at all.

"The skull is thin. The usual form of the head is high; but the tendency now is to greater width in the coronal region than there has been. They live

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longer than we do; are less *intense*, and less easily exhausted by mental labor. The electrical part of their constitution (which is to be regarded as an *addition* to that constitution which they possess in common with us) tends to preservation of the tissues, and to the diminution of wear and tear. Their arms are proportionally longer, and their feet and hands proportionally larger, than ours. In the floating movement previously described, every muscle of the feet and hands is brought into play: the increased size of those organs, therefore, indicates a correlation with the external conditions of the planet.

"I see no *new* mental faculties, no phrenological developments not common to the inhabitants of both worlds. I observe that every organ of their brain is phrenologically identical with corresponding organs of ours. The lobes of the brain are the same; but the *medulla oblongata* is much larger in their brain than in ours. Were we to dissect such a brain, it would be said that the *nervous centres were double the usual size*. This medulla oblongata is the *battery* for the production of the electrical material or fluid which circulates in their systems, having its correlation or correspondence in the atmosphere.

"This atmosphere is exceedingly clear and transparent; and their eyes, by reason of their electrical light, can pierce much farther than ours. There is something about the whole countenance markedly different from ours; and yet so like are they, that I feel they are one with us, and that we are both travelling in our little barks around the common centre, — the sun."

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LARGE MUSICAL INSTRUMENT ON MARS.

SEPT. 17, 1869.

Mrs. Cridge's thirteenth examination.

"It is in the *iris* of the eye that those appearances of points are seen; yet they are not points in the nature of *projections;* but around them are dark shades constituting a modification of the *color* of the iris, or perhaps a deeper shade of the same color, against which those seeming points show as lights on a dark ground, giving a beautiful star-like appearance to the eye.

"In stating that their feet and hands are proportionally larger than ours, I should have added that they are thin in proportion to their length.

"Their speech is largely composed of vowels and liquids, and, in its general effect, much like Italian. In their writing they have word-characters; and they can write very rapidly. The following is a specimen of their characters: —

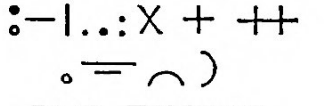


FIG. 105. — Word-characters.

"There are also a few dots and *o*'s appended, here and there, to the other signs.

"Their ink, which I now see, is of a deep indigo-blue color. The inkstand has an oblong, open receptacle at the top.

"I am in a large room, where a person is writing in characters like those of the preceding specimen.

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"And now I see a large musical instrument, having keys as in a piano, not only in front, but also at the sides, so that several persons can play on it at the same time. It is very long, and is beautiful in its appearance. As seen now, the back is against the wall; but it can readily be moved into the centre of a large room. There are also keys behind, so that persons can sit and play on that part. Sometimes as many as six persons play on it at once, when *all* the parts are open; and one or more parts can be open for playing, the others remaining closed.

"The keys are much like the white keys of the piano-forte; but, instead of the black keys, they have small keys raised above the others, which have *concave* surfaces, but are otherwise *let in* to the other keys similarly to the black keys of the piano-forte. They appear to be more convenient than our black keys. The people sing; and, when this instrument is played, it has a very fine, harmonious sound.

"The instrument is handsomely constructed: it is built of wood as a basis, the grain of which beautifully graduates from Vandyke brown to a delicate red, veined occasionally with light drab and Naples yellow. The instrument looks beautiful, whether open or closed, and has nothing of the box-like appearance of the piano. When closed, it is somewhat pyramidal in form; and, when open, has a similar but more extended form, the portions turned up in opening increasing and completing its beauty. From the top (which is some two or three feet above the keys) there is an opening down to the centre of the instrument.

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"Many of the details of its mechanism I could not clearly enough perceive to critically describe."

WORSHIP ON MARS.

SEPT. 19, 1869.

Mrs. Cridge's fourteenth examination.

"I am in the room in which I saw the musical instrument on the previous visit. The walls are nearly bare; that is, there is none of that beautiful inlaid work which I saw in another place. The walls are very smooth: if cemented, the cement looks much like smooth stone. Against them are astronomical representations. One, — very red, on a dark sky, — I suppose, represents Mars. Various other planets or stars are represented: one almost resembles a crescent moon. I do not understand these representations: but it is evident, from them and from other circumstances, that they know something about astronomy; and I notice that they observe the planetary system and the fixed stars. Some learned and scientific people have a purely scientific interest in the subject; while with others the organ of veneration is active in connection with those observations.

"They have large buildings in the form of the half of a prolate spheroid, with a top. In those buildings are representations of rather monstrous human forms, with which are connected astronomical representations. One of these human forms is a large figure made of glass, about thirty feet in height, holding in his hand a representation of a planet colored red, — Mars, I suppose. Those huge forms, however, appear small in comparison with the immense height of the building.

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"I see persons entering it, and I see them prostrate themselves on the ground before those huge forms. One of them, which may represent the sun, is composed of an alloy of copper with some gold: it is notched at the edges as the sun is represented sometimes. On a piece of something which is suspended over the head of another of those statues are fastened three small globes,* nearly equidistant from each other. Some of the statues have stars.

"In this building is a gallery, which does not go all the way round it, but leaves a space occupied by those statues, which, I suppose, must be gods."

* Mercury, Venus, and the Earth? I think they are nearly equidistant. A. C.

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MRS. DENTON'S EXAMINATIONS OF MARS. — GLIMPSE OF MARS.

MARCH 25, 1869.

First examination.

"This planet has considerable influence upon the earth; or, rather, they affect each other. I never noticed as much influence between any other two. There seems to be an intimate magnetic relation between them. The light of this planet affects me differently from any other light that I have noticed.

"I am unable to reach the planet; but I can perceive land and water. The atmosphere seems to have some different element in it from what there is in ours. Its influence resembles that which I have noticed in connection with mineral veins. I think the atmosphere must be hazy to an inhabitant of that planet.

"Now I obtain a glimpse of a structure. It is extensive, and very peculiar. There are many divissions in it, or rooms partly divided, so that persons can pass under; the partitions not reaching the floor. I think it is polygonal. Those divisions are merely curtains, I believe. It is three stories in height; both the second and third stories receding in circumference, leaving a broad terrace on each story below. The upper story has a dome-shaped covering of transparent material resembling our glass. Each terrace is covered with the same transparent material, which, with enormous windows on every side, supply the immense enclosure with abundant light and air."

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Some examinations were attempted after this; but conditions were unfavorable; and nothing more was done for more than four years.

NATURE AND ART ON MARS.

JUNE 10, 1873.

Mrs. Denton's second examination of Mars.

The following were all written out by Mrs. Denton from notes taken at the time the examinations were made: —

"I did not realize that I was moving from my place in this room: and yet I seem to see the Earth, Mars, and that star beyond (Spica in Virgo), as if they were balanced in space; though I do not see that which balances them.

"Now I see plants singular and beautiful: a gorgeous mass of foliage and bloom is everywhere before me. The appearance is that of tropical verdure, rank and rich, and as if springing from a soil moist and warm. There are plants resembling the fossil sigillaria. The many ribs of their thick, fleshy, light-green leaves, thin toward their edges into an almost satin tissue, with a purplish tinge of varying shades as they spread to the light. These leaves are very long and broad, and their foot-stalks are fluted to correspond with the fluted trunks of the plants.

"There are lilies of wonderful brilliancy, purity, thickness of petal, and size of blossom; vines with foliage of exquisite delicacy, and large but delicate bowl-shaped yellow flowers. There are also large plants with leaves springing directly from the root, and fully two feet in length. These are of a deep

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dark green; and from among them spring, also directly from the root, long flower-stalks, each terminating in a long raceme of fine bell-shaped flowers of bright red and pure white, beautifully threaded together.

"But I cannot describe half of the plants I see: they are mostly new to me, and exquisitely beautiful.

"Now I see a volcano and a long range of mountains. The scene is entirely changed, except that even these mountains are crowded with vegetation that is also new to me.

"Now, for the first time in this examination, I see works of art. They are buildings of peculiar design and elegant finish. Some of them are round, with jutting roof, forming a porch all around the building. One, comparatively small, has a tower of considerable height. This is square, both building and tower. But whatever the form, and however elaborate the style, all the parts and their finish are in such harmony as to evidence a refinement in architectural taste that is truly inspiring.

"I see a floor of white rock, which appears to be several hundred feet in length. I can see but one wall: whether there are more or not, I do not know. On this wall, which is of the same material as the floor, are elegant forms cut in relief, — plants and flowers. I think they must be the floor and wall designed for some vast building. There are chisellings in the floor; but I cannot understand the designs.

"Now I see figures cut in stone. An immensely long *beam* of stone has a vine running the entire length of it, bearing buds and large bowl-shaped

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flowers. I think it is a representation of the yellow flower that I saw on the vine; but, if so, the vine must grow to an immense size, as it is much larger here than as I saw it; or this is untrue to nature, which I can hardly believe, so natural and harmonious seems all that I have yet seen. I think this block, or *beam*, is intended as a cornice for some part of this building, if building it is. There is a great deal of work of this character about here.

"I see long polished marble slabs. The polish seems inimitable. Some of the marble is speckled, some waved and clouded, and some beautifully figured in what seem like varied forms of flowers. One long slab, or beam, is marked by all the beauty of the rose. The blushing petals, with all their clustered, shaded loveliness, gleam from that polished surface as from a perfect mirror. There is nothing I ever saw on this planet that can compare with it.

"I can see how these slabs are polished: it is done by something that is made to revolve on the upper surface, while the block or slab is gently moved along by machinery below. We know nothing of architecture compared with those people. We have no such material as they have to build with.

"I see a great deal of machinery in use here. It seems to do nearly every thing that is done.

"Those different kinds of marble are often used to form figures on buildings.

"I see a table made with open places for holding dishes. Each dish exactly fits its appropriate place. The table seems made of bands of some kind of metal, of steel-gray and gold colors.

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"That white rock is very extensively used. It looks as pure as crystal, but is not as clear."

HOMES AND HOME-LIFE ON MARS.

JUNE 11, 1873.

Mrs. Denton's third examination.

"I see immense buildings. They seem to be dwellings, and are large enough to be the homes of thousands of people. Almost every thing I see here appears to be on a magnificent scale. One of the buildings is four or five stories high, with turrets and towers, and various designs both for ornament and convenience, which altogether relieve what might otherwise prove a disagreeable monotony. This building is square; that is, it encloses a square, containing, I think, a full square mile, — perhaps a mile and a half. The lower portion is divided into sections; and between each section and the one adjoining is a wide arched way, or opening.

"In the centre of the land thus enclosed stands a large circular building, much higher than this which encloses it; and in it there appears to be performed by machinery, and with almost incomprehensible speed and ease, a vast amount of that labor so common to every household, and which, in our isolated homes, constitutes, for so many mothers, wives, and daughters, the drudgery of life.

"At the base of this central building a wide, revolving platform extends entirely around it. From this platform a track, or road, runs in a straight line to every archway referred to as between the various sections of the large square building; and over these

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roads any person residing in a given section passes at will to any other section by simply seating himself in the conveyance which passes to and from that platform at regular intervals of only a few moments each; then, stepping upon the platform until it revolves to the road corresponding to the section that he wishes to visit, he seats himself in a similar car, and is at his destination in a moment. These vehicles, or cars, are light and easy conveyances, but seem only intended for transit between these inner sections of the large square building.

"The grounds enclosed, and corresponding to these various sections, are, in most instances, divided into plats of green similar to our grass, and beds of choice and fragrant flowers of almost every conceivable form and shade. The sparkling spray from fountains of pure water washes the flowers, cools the air, and beautifies every thing around. There are here blossoming and fruit-bearing trees, and shrubs and arbors and shaded walks, and very, very much that is beautiful beyond description. Many of the trees and plants resemble those of the tropics of our own planet.

"I see a singular-looking fruit, of a pea-green color, about half as large again as a large-sized apple, but much longer than that. It has two well-defined lobes; and from the blossom-end, which is deep and hollow like a cup, grow six or eight green, narrow leaves eight or ten inches long.

"This style of building is no more common, I think, than a circular form, which is in every other respect quite similar. Both styles prevail extensively.

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"I seem to be in one of the rooms now. It is very large. There is furniture here. I see long lounges, or seats, on which people recline. I obtain this by sensing the life of the people; but I do not see them, nor many of the objects in the room.

"There is a peculiar air of scientific investigation here, — a great deal of thought, of study, an atmosphere of culture and intellectual strength. The persons here are devoted to scientific research, and in a great many different directions. I feel all this and more; but I see no one.

"I also feel the influence of great mechanical skill here; but it is subordinate to the scientific influence. The mechanical skill seems older and more perfect than the scientific ability. Both have, I think, reached greater perfection on this than on our own planet.

"Such music I never heard. I have been trying to learn its source; but I cannot find it. It is clearer, sweeter, and at the same time more penetrating, than any I ever heard before."

A SUPERIOR PEOPLE ON MARS.

JUNE 13, 1873.

Mrs. Denton's fourth examination.

"I see an immensely long building, with wide arched windows that descend to the floor. Some of these are open; and through a number of them I see persons who are apparently at home in the magnificent rooms they occupy. But, oh, such people! and such rooms! The people seem to be in advance of all I have seen on the earth in many respects. They are physically and mentally our superiors. They

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seem to have based their physical culture upon scientific principles, until they have reached the very perfection of physical development. They have studied to live in harmony with all the laws of their physical life, until they appear to have no temptation to violate those laws. The result is a wonderful purity, harmony, and completeness of the whole physical being.

"In their social life there is more leisure, more order, more individuality, than among us. They seem to live the idea expressed by the motto, 'Each for all, and all for each,' and to have done this until they know no narrow, selfish ends in life, and have no desire for aggrandizement, honor, or preferment, that is not wholly subservient to the public good. Indeed, they seem to have controlled selfishness and all the baser passions, until they are the mere servants of the higher and nobler powers of the soul. I question whether they have what we recognize by the word 'governments,' except it may be such regulations as they deem necessary for the more effective distribution of means for the accomplishment of desired ends. And in this there is not, that I can now discover, any antagonism, and never discord. Their controversies, if they have them, seem only for the discovery of truth, never for triumph of person or party. What we recognize as courts of justice are to them unknown or unemployed institutions. I sense no such difference in social conditions as we have here: I do not think they exist. I cannot find among them any persons who seem low or degraded; nor do I see such suffering as we meet almost everywhere on this planet.

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"Physically they do not appear to be as heavy as we. There is a buoyancy in this respect that I do not understand. The complexion is of a purer white than is that of the Anglo-Saxon race; the eyes are generally of a bright sky-blue; and the hair varies in shade from a bright straw to that of a deep gold color. Mentally they seem able to accomplish any thing they undertake. They have studied our planet, and have become very familiar with it. I believe they have traced us out as a people. I do not know how they have done this; but they seem to know a good deal about us. They seem familiar with other planets also. I believe we can, in time, learn to hold communication with them. Perhaps they are psychometers!

"They appear to have a great deal of time for culture; and, besides, they are such thinkers, and such workers! They make actual conditions conform to ideal conditions. All share in the delights, and all lend ready and willing aid to secure them."

AN INFERIOR RACE.

"Now I am in a place a long way from there, where all is different. The scenery is changed; every thing is changed: but the great difference is in the people. These are more like the people of this planet; that is, more like the majority of our people here. They seem like an entirely different race from those I saw before. I cannot see that these are separated from the others by any great natural division of the surface of the planet; but their condition, their habits, and their lives, are wholly different."

("What is the physical condition of these?")

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"I get mental conditions best. I find antagonisms and selfishness that I did not find with that other people. All that I see here are dark colored, — very dark; but I should not call them black. I cannot get individual features. I think there is a difference in physical structure; but I cannot get it clearly. They seem much like us in many respects. There seems to me to be a world-wide difference between *us* and the other people I saw. It will take us a long time to get where they are, even physically. I do not like to go among these people from the others. I do not think they know about the others. Yes; they know about them: but they do not seem to have the least idea that they can ever be like them; nor do they care to be like them. They differ greatly from us in this respect. They seem to feel with regard to those superior people as the Indians do with regard to us. Taken as a people, they are lower in the scale of intelligence than are many of the peoples of this planet."

HOMES AND HOME-LIFE ON MARS CONTINUED.

JUNE 17, 1873.

Mrs. Denton's fifth examination.

"Mars seems like one of our own household, it is so near in comparison with those distant stars.

"Now I see a long building like one I have seen here before, — the one with broad, arched windows. I think it is made principally of some kind of metal; but, whether metal or stone, it is deeply fluted from top to bottom. I think it is the same building where I saw the people through open windows in a previous examination.

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"I can only account for the adoption of this style of architecture by considering each of these immense structures — with their luxurious apartments, their convenient and elegant appointments, their labor-saving arrangements, and their gardens of abundant bloom and luscious fruits — as the home of hundreds, and perhaps of thousands, of individuals. All the necessities for a large, active, and refined population, appear to be collected in every one of these square, circular, or octagonal buildings, as the case may be. If this is communistic life, why have we not adopted it on this planet before to-day? (I feel constantly that they know all about us.)

"I am in a long, large room now. Every thing connected with these people gives me the idea that whatever they do or design is done and designed in the most strict conformity to such principles as must inevitably secure the object sought. For example, this room, which is immensely long and large, is so constituted, that any person in any part of it can hear the lightest whispered breath in any other part of it. I am at one of the extreme ends. There are persons at the other extreme end: they are speaking, it is evident, scarcely above the lightest breath; and yet I can hear them with great distinctness. There are persons also, in the centre of the room, who also hear them; and other persons outside of this room, just opposite a broad open glass door on the side of the room, who hear them. They seem to be testing the power of the room to convey sounds: I think, rather, they are cultivating their vocal powers.

"That broad glass door opens into a magnificent

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conservatory, in the centre of which is a large marble tank of water, in which are growing several kinds of water-plants; and around its base, on the outside, are beds of low plants of luxuriant growth and bloom. This conservatory is lighted from the roof principally. It can be thrown, with the long room I saw, into one, when occasion requires."

("Are there any people there?") "Yes: I can hear them walking and talking, but not distinctly.

"These people seem so exceedingly simple in all their habits, and, though surrounded by all this beauty, to be so earnest in their pursuit of knowledge for its own sake, and so unselfishly disposed to persevere and acquire for the sake of all, as much as for their own sakes, that I am thoroughly charmed by them. In all their feelings and their very thoughts they seem perfectly transparent, and manifest no disposition to cover up or hide any thing."

A LIBRARY ON MARS.

JUNE 18, 1873.

Mrs. Denton's sixth examination.

"I see a fruit like a pine-apple, and a plant with thick, broad leaves. There is much here that I cannot understand.

"I am in a long, large room again. In it I notice particularly a large number of globes. Some of them are revolving; while others seem to be stationary, or fixed on stationary stands. They are of different sizes; are figured; and one of them greatly resembles the photograph of our moon as seen through a stereoscope. It is of the same color; has similar irregu-

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larities; and is, I feel sure, intended to represent our moon. It is a globe of about two feet in diameter.

"I am in a room now where there are two rows of columns nearly the entire length, one on each side, leaving aisles on each side of apparently the same width as the nave. The lower part has no windows that I can discover from the inside of the room, and receives its light from windows in the story above. I do not know in what part of the building I am, but do not think I am on the first, nor perhaps on the second, floor.

"Everybody I have yet seen here wears the clothing loose from the shoulders, and merely confined by a belt at the lower part of the waist. There is very little, if any, difference between the dress of the sexes, so far as I have seen. In all cases, the dress is loose about the chest; and nothing appears to have prevented its fullest expansion. The weight of whatever is worn is supported by the shoulder; and a desire for the most perfect development of body, as well as of mind and heart, regulates all their supplies, and satisfies or controls the craving of every appetite.

"Here, too, there are grounds of indescribable loveliness, and a great variety of birds of wonderful beauty."

GEYSERS ON MARS.

AUG. 24, 1873.

Mrs. Denton's seventh examination.

"I am in a different locality from any I have seen here before. I seem to be on the land; but there is a large body of water at a short distance. A few feet

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from me, and still farther inland, there is a circular basin of water: whether natural or artificial, I cannot tell; though I think it natural, with an artificial covering. This covering is perforated by a great number of round holes, — some large, and some small. The largest, of which there are three or four, are, perhaps, from three to five feet in diameter; and others are of various sizes, from one inch to one foot. Through these perforations, jets of water are sent to various heights; the largest apparently reaching a height of perhaps two to three hundred feet or more. From this towering height the water falls in continual showers of rain and spray. There are from forty to fifty of these columns in an area of about an acre. When the sun shines, or in any strong light, this is one of the grandest conceivable sights."

A PARADE.

"Now I see a great many people on animals that greatly resemble the horse of our planet. The people are all dressed in closely-fitting garments, and appear to be divided into two parties. All are seated in the same manner; that is, astride: and yet a part of them are females. I see, however, scarcely any difference in the dress on this account. But the two parties comprising this concourse are distinguished by the color of the animals on which they ride. These are of two colors, — pure white and a rich chestnut.

"Now the party on the white animals have separated from those on the colored animals, and are riding off by themselves. There are certain persons among each party that are more richly decorated than the

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others; though their garments are precisely the same, except the decoration or ornaments. These persons are apparently leaders or directors of the movements. I should call them the 'marshals.' All these have long, streaming plumes in their thin caps; and something beside plumes, that floats back on the breeze as they ride. I do not see what their caps are made of; but they seem very thin and soft. Their dress is also of a delicate texture; but I cannot tell of what material it is made. It is of something exceedingly pliable, however. This seems to be some kind of a parade; but, so far as I can discern, I am the only spectator present. All here appear to belong to one party or the other, and all have some part to perform in the ceremonies of the occasion.

"These people are all very nearly the color of the Anglo-Saxon race." ("What is the difference?") "The only difference I notice is a slightly deeper and brighter tinge, apparently belonging to the skin itself, and giving it a peculiar pinkish hue.

"They seem to belong to a different race from that highly-cultivated people I saw in another part of the planet. Though they have adopted some of their customs, and appropriated much of the art, and more or less of the scientific knowledge, of that people, they still prefer many of the more rude and hilarious customs of their own ancestors to the more quiet and refined enjoyments of that other people. They are much superior to the dark race that I saw on another occasion.

"Now I see a large number of them with masks on. I recognize them as the same people; but they

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are horribly masked. They seem to delight in exhibitions of this character.

"Seen from the front, the animals on which they were riding do not so much resemble the horse as they seemed from the side-view I had of them. The front head is broader; the neck is more curved, and longer, but not so large; and the face is carried in a more perpendicular position, while at the mouth it is considerably narrower. The animal has a long, small tail; and its whole frame is smaller than that of the horse."

A LIBRARY ON MARS.

AUG. 26, 1873.

Mrs. Denton's eighth examination.

"I seem to be where there is water, and a broken, ragged coast. A little way back from the coast I again see jets of water like those I saw the other evening. I think it is the same place. Like those I saw before, the water of these rises to a great height, and then falls back in rain and spray.

"I am now again in that part of the country where the people are so much advanced. There is a great deal that is ornamental all through this region, both in and out of doors. That portion of the planet one would be likely to reach first in going there in a straight line from here is all, as yet, a sealed book to me. To reach the place where these people are, I have to move a long way from the place where I first reach the planet. This I have done, principally, by way of the water.

"I am now in what *we* should call an enormous

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library. The books are in much the same general style of those we use; though they appear to be made of somewhat different material. I see numbers of volumes of immense size. There are several with rods running through the centre. The rod, with the book secured to it, which is done by clasping it tightly around the rod, is fitted into a light frame in a perpendicular position. The book may then be readily raised or lowered at will by a very simple arrangement, which may be adjusted without even raising the eyes from the page. The value of such an arrangement will be appreciated when it is understood that the great length of the book would render it exceedingly difficult for one to read the upper portion of the page when the lower portion was on a level with the eye, and equally difficult to read the lower portion of the page if the upper portion of it were on a convenient level. A large number of the books I see here are fully three yards in length (with width neatly proportioned); and some are, I think, considerably longer than that. The pages in this style of book follow each other in regular succession through the book *on the same side of the leaf;* then back again, in the same regular succession, *on the reverse side of the leaf.* By this arrangement, four persons can read nearly the entire book at the same time, without other inconvenience than that of allowing to each reader sufficient time to examine one or two pages before the person intending to follow him shall commence.

"The lower end of the rod, to which the book is made fast, is placed in a shallow metallic thimble

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fixed in a movable cross-bar of wood. Another but lighter movable cross-bar, with a thimble exactly corresponding to this, and set in the same relative position, is inverted over the upper end of the rod. Both bars are then made fast to each other, and all is secure; while the rod, with its burden of art, is left free to revolve, and the united cross-bars ascend or descend at the will of the person examining the book.

"The books of this style are without covers. They have strong back-bindings, that may be clasped or unclasped around the rod at will. The clasps belong to the rod, and, when the book is in its place, are only visible above and below it. They are adjustable, and may be used for a book of the largest or smallest size.

"There are various other styles of stands for the support of large and small volumes, without burdening the reader to hold them; but I think the description I have given sufficient.

"Some of these volumes contain only paintings; others both illustrations and text. The representations they contain are faultlessly faithful. No human skill could, it seems to me, produce such truthful representations. I can conceive of nothing but the photograph that can equal them; and yet they are no more faithful in representing forms than colors, every tint of which seems true to Nature herself. I do not know how they are produced.

"This library is connected with an immense hall, in which there are several partial divisions. One of these is devoted entirely to statuary, representing

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almost every conceivable animal form. One of these statues represents four persons, so united that the four faces are turned to the four points of the compass. I get no idea of the object of this representation.

"I cannot now tell to what the other portions of the hall are devoted. The several parts are only separated by light, open work, apparently of some kind of metal, and about three or four feet high. Above this the room is one.

"I am outside of the buildings now, and see a long avenue of elegant and elaborately-finished pedestals, supporting large vases of flowers. At a distance the avenue leads up a hill to beautiful grounds enclosed by thickly-growing shrubs and vines. The grounds are laid out in figures of various forms; while trees and shrubs and flowers are grouped in the most harmonious and tasteful styles. I see no vases nor pedestals inside the enclosure.

"On the top of the hill, which is apparently quite circular, stands a very large circular building. The outer walls are almost entirely of some transparent material, which looks like our glass, and is the same as is used for windows in their buildings at other places; but I have not yet ascertained whether it is of the nature of our glass. I do not know what material has been used for the frame; but I think it some kind of metal. There is only sufficient of this framework to sustain these immense plates of *glass*, if such they are. The hill is by no means a high one. Perhaps mound would have been a more appropriate name; though it seems rather high to be called a

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mound. Taken as a whole, this is the most beautiful place I have seen anywhere. But I do not find myself able to go into the building, or to move freely about the premises. I do not think these circular buildings are quite as satisfactory in their interior arrangements as are those they have built in the form of squares; though perhaps I am mistaken in this. To my taste, the former are more beautiful to an observer at a distance; and possibly they may admit of equally convenient internal arrangements.

"I now see a broken pillar belonging to an immense structure. There are here, separated only by wide streets, four of those large square buildings, combining homes for individuals and families, academies of science, philosophy, and art, private and public libraries, conservatories of rare and choice plants and flowers, and, in short, almost every convenience and comfort that thought can suggest."

A TELESCOPE ON MARS.

"In the middle of one of these wide streets, or more properly, perhaps, open parks, between two of those combination-buildings, stands a great solid square stone tower. It is constructed with a base apparently about twenty feet in height, and extending on all sides perhaps eight or ten feet beyond the central portion of the tower. If I estimate it correctly, the central portion is about one hundred feet in height from the surface of the ground. The top is finished with a turret, so constructed that it can be made to revolve when desirable. This turret appears to be about eight or ten feet in height; and into it is

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fitted an enormous tube, which I have before seen on several different occasions, but which I have until now supposed to be a tunnel in the street; but as I could not understand its object, or the method of its construction and use, I did not mention it. On seeing it now, as before, I thought it a tunnel under a portion of the street or park, until, on moving to one side, I saw the joints of a large metallic tube. The upper end is fitted into that turret, as stated; and the lower end rests upon a movable structure or car below. I can see persons looking into the lower end of it; and I believe it to be to them what the telescope is to us. It is so large, or so arranged, that several persons can look through it at the same time. The wheels of the movable structure or car, on which the lower portion rests, are set in grooved metallic tracks, that describe several circles around the base of the tower.

"Above the base there are four or five platforms encircling the tower, at a distance from each other of from fifteen to twenty feet. The diameter of the tube is apparently from twelve to fifteen feet, or perhaps more than that. The turret is circular at the base, and divided at the top. There are small windows both in the base and in the central portions of the tower. I see none in the turret above. This is the first time I have seen *small* windows in connection with any of their structures.

"Any power applied to that car upon which the tube rests, sufficient to start the wheels in their tracks, causes the turret to revolve in an equal proportion; and the tube is so fixed in the turret, that,

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when desirable, the upper end can be raised so as to sweep the heavens from the horizon to the zenith. This is done by simply running the car on to the inner tracks around the base. The arrangements for doing this are simple, and the changes are easily made."

VEHICLES ON MARS.

SEPT. 2, 1873.

Mrs. Denton's ninth examination.

"On several occasions I have noticed a very (apparently) complicated machine. I have thought it might be a printing or stamping machine, but could not be positive. I seem to be in a room now where there are from twenty to thirty of these and similar kinds; but I cannot yet understand their use.

"I see a great variety of carriages; but they are run without horses or other animals as are required for the use of our carriages. Unlike ours, the front and back of these are the same; and they may run either way equally well; and the direction may be changed without turning the vehicle around. They can be made to move with great speed if desired, or slowly if preferred. I cannot see by what power they are propelled.

"The lighter carriages, those for persons only, are generally, I think, made with four wheels, — one in the middle, on each side; and one in the middle, on each end. Those for conveying heavy burdens have six large wheels, — two on each side, at about equal distances from the centre; and one at each end, as in the case of those with four wheels. There is also a

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kind with five wheels; but this must be turned round when its direction is changed.

"I think the moving power employed is electricity, which is apparently generated by a battery of some kind, made fast to the under-portion of the carriage. Whether this is the force employed or not, a dial, which may be readily changed from one end of the carriage to the other, marks the amount of force generated; and the amount is regulated by a rod in some cases, which the occupant of the carriage can adjust without inconvenience. The dial is generally placed at whichever end is used at the time as the front."

AERIAL CONVEYANCES ON MARS.

SEPT. 12, 1873.

Mrs. Denton's tenth examination.

"On several occasions I have seen various kinds of aerial conveyances. Some of them are large, others small. They are of several styles. In one of them that I see now, there are, I should think, from twenty to thirty persons; and it is apparently intended for a much larger number. Those persons appear to be as free from apprehension of danger as are any of our people in the various modes of conveyance in use among us. I do not understand all the principles upon which these vessels are constructed, nor those upon which their motions are governed and their course directed, all of which are as thoroughly understood by the aerial navigator there as are those that govern water navigation by the mariners of this planet.

"If some of our aeronauts could see these vessels as I see them now, they would probably comprehend

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at a glance all the principles upon which they are constructed and regulated; but I cannot comprehend them."

AN ORRERY ON MARS.

SEPT. 16, 1873.

Mrs. Denton's eleventh examination.

"I am again in a large room where there is a library with many books of enormous size. One of these, that stands open on a peculiar stand or desk, has large colored plates in it, — a great many of them. They are splendid. I think they are representations of scenes on our planet. I believe they know a great deal about the *people* of our planet. They seem to me to watch the progress of the various races here with a great deal of interest. By what process they do this, I cannot understand, — whether by their more powerful and more perfect telescopes, or whether by some other means, I do not know; but, almost since I first saw them, I have felt that they know of us.

"In another part of the room I am in, I again see various kinds of globes, mounted in different styles. On one stand a large number are so arranged as to represent some system of stars. I think it must be our solar system; but it differs from any representation given of it by our astronomers, or any that I have seen. Like the orrery, it represents the relative sizes and various positions and orbits of the planets and their satellites, — and all these in motion: but I cannot tell upon what principle they are made to revolve, as they appear to do; for I see no rods connecting them.

"I have noticed this apparent motion of globes in

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groups like this on several occasions before, but desired to discover the principle upon which these motions are secured before attempting to describe them. I have not yet been able to do so.

"If this is intended for *our* solar system (as I think it is), they have here represented *five* planets between the sun and our earth. Between Mars and Jupiter, or what seem like them, there is represented a large *cluster* of small, and some of them very small bodies, revolving on their axes; some of them with satellites revolving around them, all of them revolving around a common centre of apparently vacant space, and the whole group also revolving as one planet in an orbit around the sun. While then, taken as a whole, this group might be regarded as a planet with its centre vacant, or rather as a planetary *ring*, yet, taken as separate bodies, they *all* have the three motions common to all the known satellites; and some of them have still another motion, as of a satellite around a satellite.

"There are in this group, I should think, thousands of these bodies, of almost all possible sizes, from the largest to the smallest. Still they appear to preserve the same harmony as that which characterizes the motions of the larger planets and their moons.

"The speed on its axis of every individual body in this group is, it seems to me, incalculably great. Still, other things being equal, the smaller the body, the faster it seems to revolve. Some of these smaller bodies appear to revolve so rapidly, that they are continually swept clean of any dust that might otherwise collect on them by the wearing-away of their surfaces.

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This dust (for they do wear, however slowly) is constantly drawn up toward the *equator* of the body, and there thrown entirely off its surface, where it forms a dusty ring, still revolving, though with less velocity than when it constituted its share of the rock of which the body was composed. By this means some of these bodies are masses of perfectly naked rock, and are gradually diminishing in size.

"I seem to get these last few particulars rather from examination of the bodies themselves than from representations by the apparatus I was attempting to describe. I know I do not see here such an immense number of bodies represented, nor yet the revolutions that change any loose material on the surface into dusty rings, entirely free from contact with the body in motion. All the other particulars seem to be very faithfully represented by it. I have not counted them; but I think there are from two to three hundred of the bodies of this cluster represented by this apparatus.

"I do not seem to reach the planet at the same point that I did some time ago. I have to move some distance after reaching it before I get to these people."

("Are there warmer places at the poles?")

"I think there are. There seem to be both land and water in both polar regions, — more land at the south pole, more water at the north pole, if I get the poles correctly.

"A little back from the north polar point, there appear to be, on one side, high rocky cliffs. On the other side, the land is apparently on a lower level; but it seems to me to be damp, cold, and unpleasant. The

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water around the pole is not frozen, and even seems warmer than the land.

"Back of the rocky cliff there appears to be a belt of ice and snow that encircles that portion of the planet.

"There is, I think, a similar belt of ice and snow encircling the south polar region, but at a greater distance from the southern polar point. The land near the south pole seems to be much lower than that near the north pole, and the climate seems warm and delightful."

("Can you go to the night-side of the planet?")

"It appears to be night now on the side of the planet where those refined people live.

"They have an artificial light that seems to me more like sunlight than any thing that we use. The nature of it appears to be quite similar to the light of the sun. It gives the same tint to colors. It illuminates a vast expanse, and almost turns night into day. With their windows open to this, they require no other light in their buildings: indeed, I think that any artificial lights we use would pale before it as the light of a tallow candle does in the light of our common gas. I do not see what gives this light: but it is apparently a long way off; for the light is *diffused* much as is sunlight when the sky is overcast by rather thin clouds."

SLEEPING-ROOMS ON MARS.

SEPT. 20, 1873.

Mrs. Denton's twelfth examination.

"I am in the very attic of a division of one of those large square buildings. The entire roof, except the supports, is of what I think I must call glass, as all

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their windows are made of it. The roof is dome-shaped, or as nearly so as it could be made and have any framework at all. The whole attic of this division is, I think, in one large room. No; I am mistaken: this room is only one portion of the division. It is so large, I thought it the entire attic. In this room there are no less than eight or ten *lounges*, I think we should call them. There are several persons asleep here on these lounges; but no lounge has more than one person on it. They have all lain down with the same clothes on that they have worn through the day. I am quite surprised at this; for I thought to find them as particular in reference to their sleeping arrangements as in reference to other matters. These lounges are not of 'downy softness;' though they are not hard, by any means.

"They seem to have chosen this high part of the building for the sake of the dry, pure air; and this style of roof, that the room may receive all the rays of the sun possible.

"At one end of this room there are three bathing-apartments with closets, in which are entire suits of fresh, clean clothing for each individual. Before bathing, each individual old enough to do so, whether male or female, arranges his or her own bed or lounge. The men occupy one of the bathing-rooms, the women another; and the children are taken into and bathed in a third, which, in this case, appears to be between the other two. With them, as with the older persons, the entire suit of clothing is changed every morning.

"I see no windows in the sides of the room where

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I am; but, at a short distance from here, I saw one with the walls, as well as the roof, almost wholly composed of windows. In that room the wall-windows have heavy curtains, which are sometimes used to shade them, and are sometimes looped back at the sides. They were looped back when I saw them. I am mistaken in reference to there being none in this room I am in. The walls here, as at that other room, are almost wholly composed of them; but they are so thickly shaded, I did not see them. These curtains are also removed from before the windows, unless when the room is in use and the occupants prefer them closed. When they are closed, however, it is only to shut out the side-light, or to protect from observation. The entire roof is without shade that I can discover, and, I think, is never intended to be shaded. I think this is the general style of their sleeping-apartments.

"I do not know how many baths there are in each bathing-room; but there are quite a number of them. Even these bathing-rooms are separated from the sleeping-room only by windows that come to the floor, and, except when in use, are left uncurtained, and are, as the sleeping-room, almost wholly of glass.

"All the buildings of these people appear to be so constructed as to allow the occupants the greatest possible amount of sunshine and air that may be secured to them in permanent dwellings.

"I see no lounges in this sleeping-apartment that seem to be intended for more than one person. Whether they have such or not, I do not know; but men and women are both sleeping here."

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A DINING-ROOM.

"I am down in a lower room now. I think it cannot be less than a hundred and twenty-five feet long. There are in it three long tables, with three or four short tables at each end of the room.

"These tables are very peculiar. They are mere frames of wood, into which are set, on both sides and at each end, small metallic frames fitted for various forms of dishes, much as our castor-stands are fitted for the castors we use. This metallic frame is so arranged that it may be made to revolve at will, or it may be made fast at will. I think this is done by pressure upon a certain pivot fixed in the wooden frame. Into this metallic frame, which is really a model of beauty by itself, are set all the dishes of whatever kind desired or intended to be used by each individual at any one meal. I do not know by what means they ascertain the desires of each individual; but, by some means, individual tastes are consulted, so that all are satisfied. I think the metallic frames in the several tables are all numbered; and, in the long tables, there are about a hundred in each side of each table, and ten or twelve on each side of the small tables. With this arrangement, every individual has really a revolving table to himself. There are thus no waiters required; and there is no reaching to other parts of the table for supplies. I think they would regard our system of 'waiting upon table' as not only cumbrous, but as confusing beyond endurance.

"They do not appear to require a great variety of food at their meals · but I cannot tell what they use.

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"They are remarkably social at table; and *all* appear to be entertained and entertaining. I see no *very* small children at these tables. I judge this room is used only as an eating-room.

"That frame I mentioned in one of my earlier examinations of this planet as being a framework for dishes, I have never understood until now. That was made in a similar style, though it was entirely of metal. There were but four of those revolving parts to that; and I fancy it may have been intended for a group of three or four persons who might wish to converse upon topics of interest to themselves, but of less interest to the large number of persons present at the large tables, and to save confusion by conversing on other than the general topic for the occasion. Or those small tables may be used for persons, who, from age or other reasons, are unable to leave their rooms for the general eating-room.

"They have a machine for sweeping their rooms that seems to move automatically. It is set in motion, I think, by being wound up; but I cannot understand upon what principle it is constructed. It is from three to five feet high, and is covered with some kind of thick cloth which confines all the dust. They set it in motion, and have no more to do with it until it stops, which it seems to do in the centre of the room. It sweeps the outer portions of the floor first, gradually diminishing the diameter of its coils until it reaches the centre. I see no furniture in the room where I see it in operation.

"These people appear to exercise great care in reference to permitting any uncleanness. I feel no influ-

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ence of filth or of decaying matter anywhere about their buildings or their grounds; and I see nothing in their country that appears to look like it."

In these examinations, there are, as were to be expected, several apparent discrepancies; most of them resulting, I think, from the different portions of the planet, and the different peoples residing upon them, that came under the notice of the respective psychometers, and this owing, in a great measure, to the different times at which the planet was observed. It would have been much better, I think, could the planet have been observed by each at the same time of the year and of the day; but this I did not think of till it was too late.

From these examinations, I judge that there are at least four distinct races of human beings on Mars, between some of which greater differences obtain than between any existing races on our own planet.

The four-digited race, seen only by Sherman, occupies, in my opinion, a region in the immediate vicinity of the equator; probably that called Madler Continent, as represented on Proctor's map, which is probably correct as far as the main features of the planet are concerned. This is the locality he first reached, and where he saw the turtles and monstrous trees.

Much inferior to this is the dark, stunted race seen and described by Mrs. Cridge and Mrs. Denton. Of their location, Mrs. Cridge says that they are "in the south-western portion of the Western hemisphere, approaching in that direction to the verge of the

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Eastern, on a large tongue of land jutting out into the sea, something like Southern Africa, but smaller, in the southern hemisphere, but not near the south pole." By looking at the map of Mars (Fig. 106), it will be seen that the western part of Secchi Continent, which extends into Maraldi Sea, corresponds exactly with the position she assigns to this race. When Mrs. Denton saw what I think is the same race, I asked her to point out on the map that portion of the planet on which she thought this inferior race resided. She pointed to the western part of Secchi Continent, at the locality marked by a cross on the map. Sherman does not appear to have seen this race at all.

A third race is the pink-skinned, and, as represented by Mrs. Cridge, the star-eyed race, seen and carefully described by Mrs. Cridge, noticed by Mrs. Denton, and, as I think, frequently visited by Sherman, who, however, does not notice that they are different from the people of this planet. This race appears, as a race, to be considerably in advance of all the races on this planet in many respects; and yet if they worship images, as Sherman and Mrs. Cridge describe them as doing, we must consider them as decidedly inferior to us in some other respects, though decidedly in advance of the four-digited race. This pink race lives principally, as I think, on W. Herschel's Continent; and Mrs. Cridge's observations during her last seven examinations seem to have been almost entirely confined to a city in the northern part of that continent occupied by this race. Being winter when she visited it, she did not notice many things that attracted Sherman's attention.

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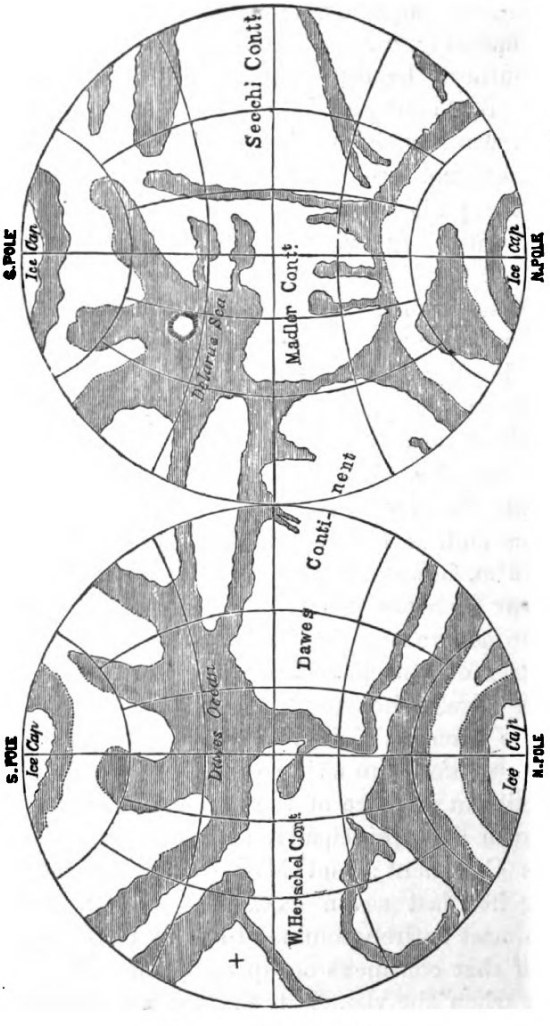


FIG. 106.—Map of Mars.

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A fourth race is the superior race, described by Mrs. Denton alone, who occupy, as she thinks, Dawes Continent, which extends from a few degrees south of the equator to the northern portion of the north temperate zone. This race appears to be far in advance of the other races on Mars, and has adopted the communistic system of living, and carried it out as it only can be carried out by human beings who have advanced much farther in intellectual and moral development than time has allowed any race to do as yet upon our own planet.

JUPITER.

Jupiter is by far the largest planet of the solar system, being eighty-seven thousand miles in diameter, and more than twelve hundred times as large as the earth. It has four moons, which accompany it, and revolve around it as the moon does around the earth. Its gravity is so much greater, that a pound-weight on our planet would weigh about two pounds and a half if carried to Jupiter. The year of this planet is nearly twelve times as long as ours; but its day is a little less than ten hours. The seasons are but slightly varied. Summer reigns during the whole year near the equator; while the temperate regions have a perpetual spring, and the polar regions constant winter.

So rapid is the motion of Jupiter on his axes, that the equatorial diameter, in consequence of the bulging-out produced by its centrifugal force, is 4,900 miles greater than its polar diameter.

Our psychometric researches have not been directed

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to Jupiter as much as to Mars; and I had thought, at one time, to publish nothing in reference to Jupiter till we could have given to it more careful scrutiny. Other matters, however, crowd upon us: and I give the following fragmentary observations of Jupiter by Sherman, which are almost exclusively confined to the animals and plants of the planet, which seem to differ very considerably from ours; and my sister's more elaborate examinations, principally of its human occupants.

PLANTS AND ANIMALS OF JUPITER.

MARCH 1, 1869.

Sherman's first examination.

"I am not far from it, and I see a great crater. The mountain looks so curious! It seems flat. I am over it, and cannot see any peaks; but I see the crater very plain. Cracks go out from it; and they are filled with something lighter colored than the mountain. As I go nearer, it is brighter: it must be lava. No: when I got nearer still, I saw it was light from somewhere else. It reflects the light: it must be the sun's light. It has been lava once. It is glassy, and has bubbles. The crater must be four or five miles across. There is a wall all round the crater.

"There are some very stunted trees there. They are more like trees than any that I have seen on the planets before; only the leaf is very thick. It is about four inches long, a quarter of an inch thick, and three inches wide. When you take hold of them, they stretch like rubber. It is hard to pull: but I pulled one out till it was about a foot long; but it was nar-

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row. It went back slowly to the shape and size it had before. The tree is about six feet high, and four or five inches through, and bends very easily. It bends with an even curve. Why! the tree stretches too, but only a little. I stretched one about two inches. I notice, when I pull the leaf out, the veins stand out like ridges on it.

"Down the mountain I see more trees. I see another kind that look like toadstools, but are no higher than my head. There is a tall plant too, of a sea-green color, with a large body, and two branches that curve toward each other to the top, and have a flower on the end of each. It seems as if it would break rather than bend; but it is soft, and something like pickled cucumber. They look very pretty. The flower is pink; but the leaves of the flower are green.

"That must be a good way off: it takes me some time to travel (twenty seconds, perhaps).

"I see another kind of plant, small, something like a thistle; but it is brown, not so large, and much thornier. The thorns are something like those of the locust.

"Why! in one place the ground is all like clay, but a great deal stickier. When I put my hand down, I cannot get it up without sliding it along, and lifting up one end. When I stamp on it, it trembles all over like jelly.

"What a curious animal I see! The mouth opens from side to side, instead of up and down. It is black, and spotted with yellow. It goes as slow as a snail. It is about three feet high. I see no legs. It is flat, round on the bottom, and moves like a snail, and

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very slow. I see no eyes anywhere. Now I see what look like grasshopper's eyes on each side, about an inch across. They are divided, and made of little six-cornered eyes, that look like the cells of the oil-coral. I thought they were eight till I counted them. They are larger than the coral cells. The animal is all smooth, like a lizard. It eats the leaves of that soft-bodied plant. It always stands up and crawls on its broad end. If a man should see such an animal, it would scare him. It has no teeth, but sucks its food off, and makes a noise as it does it. It moves its mouth fast. It bends the upper part of the body about, and is wrinkled in the middle. It opens its mouth so wide, that the sides lie back."

After supper the examination was continued: —

"I go through a great many clouds to get to that planet: they are white clouds.

"The lips of that animal are hard. There is a pipe goes from the mouth through the body in the inside: it enlarges gradually to the middle, and then gets small toward the bottom.

"I see one of the kind of trees they live on, much larger. It is ten feet high. In some places I see old dried-up leaves as thin as paper, and places where these animals have eaten leaves, and young ones are shooting out. I see more of those animals; but the one I saw before is the largest.

"There is a small animal like a bug on that thistle-plant. It has red wings, spotted black. The legs are like thorns. There is a horn on its head. It is the most like an animal of this world of any I have seen here.

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"Down in the swamps, and by the water, I see those toadstool-plants. The water looks the same as the water here; but the taste is very bad. It is horridly bitter: it just seems as if it would strangle me. I see a large body of water; but I do not see a living thing in it: it is the same as the other. The ground under the water is as white as paper; and, when I touch it, it roils the water like milk. Every little wave shakes it about. That white stuff is more bitter than the water.

"I see another splendid mountain, and a small stream running down it: that is good water, like ours. There is a rock on the mountain, soft and white as chalk, and easily broken. When I rub my hand on it, it makes it white. It looks like chalk.

"Well, if that is not strange! I see two large birds that look much like our birds. They have wings covered with hair, instead of feathers: their bodies are too. They are about two feet high, and have a beak about as long, that seems to be in the way. The neck is as short as a hen's. They swim on that body of water."

PLANTS AND ANIMALS OF JUPITER CONTINUED.

MARCH 7, 1869.

Sherman's second examination.

"I see an animal with a head that looks like a bunch of leaves. It lives in the water. It has very long claws; only three. It is a hairy animal. It crawls along at the bottom of the water. It is in this bitter water. I see small eyes among the hair. It

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sucks in that white stuff with three suckers that have little holes at the end. The long claws are white.

"There is a curious plant growing out of the water. The top of it looks like a bowl or a toadstool upside-down. It is very pretty.

"I see a kind of mineral about as soft as molasses-candy. You cannot drive any thing into it forcibly; but you can push it in gradually. It is near the water, and full of bubbles. It is red. When I stand on it, it sinks down; but, when I kick it, it sounds like a stone.

"I see a great flock of those birds I saw last night. They go 'Peep, peep!' and it sounds like frogs in a marsh, — some near, and some far off.

"Well, I declare! I see an animal like a great Newfoundland dog. It runs after the birds, and tries to catch them; but they can run faster than he. It has sharp pointed teeth, and looks as if it lived on flesh."

NIGHT ON JUPITER.

MARCH 18, 1869.

Sherman's third examination.

"I do not seem to be in the same place, and hardly on the same planet, that I was before. I see no bitter water; but there are hills that seem to be made of soft chalk. I see no animals here, except a kind of water-animal, like a turtle, that seems to leap along in the water."

("Go to the dark side.") "I see lights just like the northern lights, but very bright.

"This is a beautiful place where I am. I can see hills away off. I can see little things jumping along

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in rows in the water: it is so light, I can see them. I can see two moons, and one half way up. They are none of them as large as ours. The one highest in the heavens looks largest. I see a star very bright. Oh, how those lights shoot up! When I get in the shadow of a hill, and look over it, it looks like a red line along the outline of the hill.

"There is a marsh near here, and the grass sticks up something like rushes. I hear little animals, 'Peep, peep!' and the water in places rushing along." ("Go to the light side.")

"I see plants on the ground, almost as round as wheels, with ribs like spokes. There is a small circle in the middle crossed by lines, and lines from that all round. They are about two feet across. They are very hard and durable. It does not hurt them to step on them. The stalks break off like wood when they are twisted.

"I see a plant something like a cactus, but without thorns. It is in flower: it has little red flowers on the green body. There is fine grass on that planet, like silk. Some that I saw on the night side looked like changeable silk of beautiful colors.

"Under a big stone I see a bird's nest, made of brown earth, and lined with those leaves that are like paper when dried. There are two eggs in it; but I hardly know whether to call them eggs. They are curved at one end, and are set on the other end, which is flat. They are of a light-yellow color. Those dog-like animals live on these big snails. I see one grabbing a snail, and tearing it to pieces.

"When I get up high on this planet, it seems very

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uneven. I see smooth hills in ranges like great waves.

"I see something in a little brook that resembles a fish. It has a sharp tail that turns up; but it does not use it in swimming.

"I've come to a very high mountain now, and I've found another new animal. It resembles a snake; but the head and tail are both sharp-pointed. It has something on the end of its tail that is almost transparent, so that I did not see it.

"Well, I see another animal still. What a host of animals there is! I see a little pool of water on the side of the mountain; and there is a jelly-like animal in it. I can see through it. A blow strikes it in two. It floats round, and does not seem to have much motion.

"I see a thing away down from the mountain that looks like a little black speck. It is near a body of water. It is one of those big snails. It is four feet high, and two feet through. It stretches out one side, and draws the other along, and goes faster than I ever saw one before. It is very big round, and has a monstrous mouth. I thought certainly it was a man."

BALLOONS ON JUPITER.

MAY 15, 1870.

Sherman's fourth examination.

"This is a place where I have been; but I see some things that I never saw before. There is iron here, and houses are made of it: the whole frame is iron. The people do not look much different from

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people here. They have large beards: there is more hair on their faces than on their heads.

"Oh! I see a very nice floating apparatus, — a kind of boat. It is in the shape of a large swan, and goes by machinery, — a spring like a watch. They wind it up with a large crank. It goes very fast. It goes with paddles.

"The people are larger, if any thing, than they are here They have very broad shoulders.

"They have balloons here. They are square at the bottom, and go up to a point. They go up better that way. They have lighter gas than we have, and they go up very high.

"When the balloon gets so high that it cannot go any higher, it stands still. It cannot come down fast, because, as it goes down, the air makes a wheel turn round, that keeps it up a good deal.

"It is down now: the men below brought it down.

"They have boxes of the gas, with iron on the bottom to keep them from going up; and they let a little out of a small hole. It makes a great noise as it goes out. It takes very little to fill the balloon, — not more than I could hold in my hand. It swells out. I can see the balloon swell as it goes in."

STRANGE FLYING ANIMAL ON JUPITER.

Nov. 13, 1870.

Sherman's fifth examination.

"I am at that star all right now. I am in a thickly-wooded place. The trees do not resemble any I ever saw before. It is raining very hard. There is grass

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here, that has a great many blades on each stalk. The country is very wild.

"I see an animal flying; but it is not a bird. It has no feet, but some kind of projecting things that fold all up. Its wings are leathery. Its mouth is in the middle of its body; and it doubles up to open its mouth. The wings are square, and there is bone all round the edge. There are holes above and below the mouth. It can fly one way just as well as another, — up or down, backward or forward. It is covered with little scales. It is about as large as a robin, and is of a brown color, with a red spot in the centre of each scale. It feeds on grass and vegetables. It has no teeth exactly, but little rough things that bend in. The grass is bluer than ours."

MRS. CRIDGE'S EXAMINATIONS OF JUPITER. — THE ATMOSPHERE OF JUPITER.

DEC. 10, 1869.

Mrs. Cridge's first examination.

"The predominant color of the atmosphere (outer), which is rare, is a pale straw-color. There is a remarkable absence of redness in the atmosphere and in all thereto appertaining. Prismatically, the colors would probably be exhibited in the following order; viz., snow-white, vapory-white, pale shading into deep yellow, a very pale green, slight purple, very feeble red." (See Ex. 3, par. 2, and Ex. 4, par. 1, relative to redness.)

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ATMOSPHERIC PECULIARITIES OF JUPITER.

DEC. 12, 1869.

Mrs Cridge's second examination.

"The atmosphere immediately surrounding the planet is not of great height. There is about the heat and light that peculiar softness, and freedom from glare, which characterize them when reflected; and though there is not directly the warmth experienced in our planet at times, and in some places, there is also a freedom from severe cold.

"Up to this time, the feeling is one of *recognition* rather than of actual *presence*, as if the psychometric power went in advance of myself.

"Outside of the atmosphere immediately surrounding the planet I perceive another, more ethereal, and of much greater depth.

"Electricity is a less prominent feature in Jupiter than in Mars; and in this atmosphere there are less motion, less circulation of properties, gases, &c., than in that of Mars: there are in it great quietness and rest; and, to those whose organisms are adapted to the planet, it is highly invigorating.

"Jupiter is a very old planet, and has many times changed its characteristics, including its immediate atmospheres, whose modifications have corresponded to the successive changes in the planet, which still continue.

"In examining successive planets, I increasingly realize that their atmospheres are ponderable; each having its appropriate place around its respective planet, of which it is a permanent part, as much so

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as are the rocks or the water: those atmospheres are like things *grown out* of their respective planets, which they accompany in all their movements."

THE TEMPERATURE OF JUPITER.

"On nearing the surface of the planet, I realize more fully the absence of extremes in temperature. The light is of a peculiarly subdued character. I find my nature becoming assimilated to, or harmonized with, that of the planet, thus experiencing a capacity for enjoyment of conditions, which, to our present organizations, would not be pleasurable. For instance, what there constitutes an agreeable temperature, would be to us, as now organized, uncomfortable."

ATMOSPHERE OF JUPITER CONTINUED.

DEC. 17, 1869.

Mrs. Cridge's third examination.

"The inner atmosphere is warm, the outer cold, and still colder as it recedes from the planet. The inner atmosphere is, more than the outer, akin to the planet in its present condition, and has great power to absorb and retain heat.

"Now I realize the quality of redness somewhere, which I cannot localize.

"The atmosphere next the planet differs in color from the stratum above it; but they merge into each other like the colors of the spectrum. The former is denser than the latter, and has a much stronger chemical affinity with the planet; so that, by the attractions both of gravitation and affinity, it is necessarily contiguous thereto.

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"I realize psychometrically that there are human beings on this planet, but do not yet see them."

ATMOSPHERIC PECULIARITIES CONTINUED.

DEC. 19, 1869.

Mrs. Cridge's fourth examination.

"The redness is peculiar to the *inner* atmosphere, in which yellow and red predominate: in the next atmosphere yellow alone predominates, which becomes paler and paler as the successive atmospheres recede.

"By reason of the peculiar capacity of its inner atmosphere for absorbing and retaining heat, the planet enjoys a much higher temperature, than, considering its distance from the sun, would be supposed. The atmosphere is likewise retentive of light, which causes the sensation of their being reflected (Ex. 2, par. 1). Thus this retentive atmosphere seems, as it were, to brood over the planet, overshadowing it with a sensation of comfort and warmth, and with a rich radiance, having all the mellowness characterizing a beautiful day here before sunrise or after sunset, but with more light, and less glare."

THE SURFACE OF JUPITER.

"Now I realize that I am on the surface of the planet; but there is an indistinctness of vision, a consciousness of influences and surroundings not yet definitely outlined.

"I feel a power by which I am enabled to compare the specific gravity of substances in this planet with corresponding substances on earth. The rocks and

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earth here (in Jupiter) present similar appearances to those of this earth, but in weight are as sand thoroughly dried to sand thoroughly wet, or perhaps even a greater difference than this proportion would represent. The impression received is that of its being the same *matter* substantially in each case, but that, in Jupiter, it is freed from the gross dead *weight* belonging to a condition less developed."

DISTRIBUTION OF LAND AND WATER.

DEC. 20, 1869.

Mrs. Cridge's fifth examination.

"There is more land on it than water, and more land in the northern than in the southern hemisphere. In specific gravity the water approaches the land much nearer than on our earth: I do not perceive any marked difference in specific gravity between their water and ours. In the southern hemisphere I perceive many small islands. Only in one place do I see an opening by water to the north pole, which is surrounded by water, — a very small sea, however, compared with the magnitude of the planet. On one side this sea is frozen, and there is snow: on the other it has thawed."

THE INHABITANTS OF JUPITER.

"Near the equator I obtain glimpses of inhabitants, whose physique corresponds with that of the planet, their bodies being remarkably light; a person whose weight we might suppose, judging from stature, to be one hundred and twenty or thirty

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pounds, being as light as an infant, and weighing not over eight or ten pounds, taking our standard.

"There is very little cold on this planet. By reason of the matter being less gross, and imponderable elements consequently more powerful, there is more heat born of and belonging to the planet, — chemically produced, as perhaps it may be said. The imponderable agencies have more to do with its evenness of temperature than any other causes.

"It is an old, old world. I receive the impression of a constant, long-continued process of gradual purification; the grosser materials being thus eliminated, refined, or rendered imponderable: hence its present low specific gravity. Once it was as dense in its composition, and as near the sun, as the earth is at present; but it has gradually enlarged its orbit, at the same time growing, and purifying itself.

"All the inhabitants yet seen by me have light hair and blue eyes: blondes certainly predominate, and may be universal. I touch them, and realize that they are flesh and blood like ourselves, but lighter, and, like their planet, more largely constituted of refined and of imponderable elements. They have a stronger hold on life than we have, and live much longer than we do. One cause for this is, that the imponderable elements of which they are so largely constituted are eternal in their form of existence, making the whole physical being less subject to decay than with us.

"On the equator the people can float in the atmosphere with less movement or muscular effort than we make in swimming. They do not ascend to any

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great height: I have not seen them over thirty or forty feet above the surface. This power is not used as a means of travel, but as a recreation, and decreases with the increase of latitude.

"All the people I have yet seen are very beautiful, not only in the outlines of the form, but in the expression of the countenance: I have not yet seen one uncouth form. They eat less than we do."

MODES OF TRAVELLING ON JUPITER.

JAN. 5, 1870.

Mrs. Cridge's sixth examination.

"These people travel, and have tracks laid down. Their motive-power is electricity, which is generated by a very small apparatus. They travel noiselessly. The wheels of their vehicles are broad. The tracks are coated with a material resembling gutta-percha, which has the effect, I think, of much diminishing the friction, by means of its elasticity. The same apparatus, however, would not operate similarly on our planet.

"Jupiter is well populated; there being, in the equatorial regions, thousands of cities.

"In connection with their travelling arrangements there is a great feeling of *safety*. In addition to those vehicles above mentioned, running on prepared tracks, they have smaller ones, propelled by the same power (which is located just in front of the vehicle), and needing no tracks, and capable of going wherever a horse could go with such a vehicle. The wheels are low and small; and the material of which they are made is, *to the sight*, just like our iron; but, on

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handling it, the great difference in *weight* is realized. To the *Jovians*, however, it is just as hard and heavy as iron is to us.

"Now I see birds in flight that are as large as ostriches.

"The vegetation is green, and the foliage can only be compared to the most rich and beautiful spring foliage on earth: it is the beauty of tropical vegetation without its heat, with no indications of past or prospective decay, but showing an absence of the burning, scorching sun, and the presence of a mellow, nourishing, perennial warmth.

"Now I approach some learned men who have dived into the mysteries of Nature. Their heads are large. Now I find myself in a house, which, however, I am unable to describe. I am so disposed to float around, wanting to see every thing, that I see nothing thoroughly. I see some portions of a location at one time, and some at another. I see some things, and not others, in a place. There is not *complete* vision."

DWELLINGS ON JUPITER.

FEB. 10, 1870.

Mrs. Cridge's seventh examination.

"In the same city in which, on the preceding visit, I saw carriages of various kinds, I now obtain glimpses of large glass houses used for fruit-growing. This is in the northern hemisphere.

"Jupiter is generally not only well populated, but well cultivated.

"In a high southern latitude I perceive a locality,

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the climate of which is not very hospitable: it is like stepping into another world. The vegetation is generally scrubby, and invariably tough; the fruits few, and not juicy. The finer fruits cannot be grown there. The inhabitants are dark, hairy, of small stature, and impress me as being the last of an inferior race, to which the planet, in its present highly-advanced condition, is not adapted, and which now, in proportion to the aggregate population of the planet, numbers very few. These few are doomed to die out, as there are not in Jupiter, as there are here, the elements for the growth of such a race. They seem but a remnant of the past. I am not attracted to them.

"The bulk of the land is in the northern hemisphere. The continents, in several places, stretch far to the south in promontories, one of them reaching to the south pole.

"Though conscious, as heretofore, that the planet is thickly inhabited, I find myself mainly confined to one *city*, — if the use of that term may be permitted to characterize a locality which is unlike our cities in every respect but one. It is, I think, very near the equator. The inhabitants live very much in the open air, and are not troubled with storms. I infer the latter not only from the general character of the atmosphere, but from the structure of their houses, which is as different from that of ours as possible. They resemble beautiful *canopies*. I see no doors, no bars, no locks, no dividing-lines, no fences. They may be compared to enlarged summer-houses. The city is a beautiful garden: everywhere there is verdure, —

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trees, grass, flowers, lawns, walks. Appearances denote it to be a city of equals, where honesty and justice are paramount.

"There are large buildings. Now I am conscious of one quite high. I am conscious of its strength; yet it is so light, that on earth it would seem fragile. It is an observatory. They are making astronomical observations. To the lenses they use is added something not in our lenses, which increases both the clearness and the magnifying power: I think this additional substance is metallic. By means of their superior advantages in this respect, they are better acquainted with the sun, and the solar system generally, than we are.

"Science and intellectual culture are not, on Jupiter, restricted to certain classes, or to one sex; but men and women are equally interested. There, however, as here, woman is generally more spiritual and intuitive than man; but the two make one, and, by their junction, have accomplished *so* much! — the one supplementing the other, as, in many cases, the intellectual and the intuitive do here. There it is so in nearly all cases.

"They care less for money, and more for science and culture, than do the inhabitants of this earth. Science and culture constitute more of their life, their ambition."

ASTRONOMICAL INSTRUMENTS AND OBSERVATIONS.

FEB. 21, 1870.

Mrs. Cridge's eighth examination.

"The inhabitants have made great progress in astronomy, the knowledge of which is not confined

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to a few. The place near the equator, which I have several times visited, is a gathering of persons specially interested in that science. Those places that look like canopies are temporary edifices, made of metal, and covered with something similar to paint. They are very easily put up and taken down, are quite ornamental, and contain articles resembling chairs, tables, and lounges, but of more beautiful forms than similar articles here, and all of them *cast*.

"Some special astronomical observations are now being made; for which purpose the people have gathered, being of both sexes, women predominating in number. They are taller and more slender than average Anglo-Saxons, yet beautifully rounded. Blue eyes greatly predominate. Their necks are longer, and shoulders more sloping, than ours, — a conformation adding to the beauty of the women, but which I cannot say that I admire so much in the men. The mental temperament is uniformly predominant. Though so beautiful, so finely organized, and so highly cultivated and refined, they have a much greater hold on life than we have.

"Those canopies, pavilions, or whatever they may be termed, are erected among trees (both fruit-bearing and ornamental), planted with especial reference to such gatherings. There is no stiff uniformity either in the style or size of those edifices, which vary in the latter respect from that requisite to the accommodation of one or two persons to a capacity adequate to the requirements of fifty or a hundred inmates; so that any degree of privacy on the one hand, or of association on the other, can be secured. Some of

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them are circular, — not a plane circle, but with indentations. There is a very large fountain, throwing water two hundred feet.

"In the vicinity I notice numerous observatories. The place is located on a very high hill admirably adapted for astronomical purposes. Suddenly I find myself looking through one of their telescopes. At first the planets appear much the same as they do through our telescopes at similar distances; but, by a slight alteration then made, the planet is suddenly brought before one, so greatly magnified that the vegetation and the inhabitants can be distinguished. I looked through one of the glasses, and saw a planet to this extent; but, before I could note further details, the psychometric condition ceased."

ASTRONOMICAL CONVENTION ON JUPITER.

MARCH 1, 1870.

Mrs. Cridge's ninth examination.

"In one place near the north pole a point of land projects into the water, and almost reaches the pole. I again realize the very great predominance of land over water in the northern hemisphere as compared with the southern. Near the north pole I see snow falling. At a considerable distance from the equator, in both hemispheres, winds are common, becoming, in the polar regions, quite violent; while at the equator, and for some distance on each side, winds are unknown.

"So far as yet observed, their vegetation is much more enduring and longer lived than ours.

"The women are strikingly beautiful.

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"Now I am again in that place near the equator. I see the people all gathering in a beautiful place to take their meals, — all dining together, yet in groups, in one beautiful building. I see no indications of what we call *business*. The minds of all are directed to the observatories. Many are writing in their own pavilions. They write as fast as they talk. The writing is all curved. I see no marks below or above the lines. They use no ink, but write straight along. The writing is very clear, and exceedingly enduring.

"Pictures are taken of the planets as seen through their telescopes.

"Now it is night; and all over this place are lights. The illuminating agent furnishes a soft but very powerful light. They take those planet pictures by night. Some of them show the distribution of land and water on the planets respectively represented. Those first taken are very small; but they have a method of reproducing them on a larger scale, so as to bring out the details. Copies of those pictures are passed around among the people, who examine them with the deepest interest: they are evidently no mere spectators or curiosity-seekers.

"I perceive in their natures a love of fun. I see no traces of pecuniary anxiety. There is rest; there is freedom in a high degree; and there is a lively, inexhaustible, ever-present interest in that which is truly scientific. *Play* enters more into their life than into ours; the playfulness, buoyancy, and mirth of childhood being but little diminished even when old age creeps upon them. From all their greatness and their wisdom, they are not ashamed to descend (if

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descent it can be called), and become as little children.

"I am as yet uncertain whether this place is a gathering of *savans*, or whether it represents the usual life of the people. I am rather inclined to the idea that it is a convention of persons interested in science, always in session, and always open to any person.

"There is here an entire absence of parade and of elaborate ornamentation: the beauty so all-pervading is obtained by ready and simple means.

"The robes worn by the ladies are each composed of but one piece, except the sleeves, and fastened by a girdle. They are easy, flowing, and free from any thing elaborate: yet nothing about them indicates any thing like carelessness, neglect, or lack of refinement; on the contrary, every part of the countenance, and every movement of the body, expresses refinement, polish, grace. Looking at those people, it may be said that the ideal and the real are wedded."

A GENERAL VIEW OF JUPITER.

MARCH 5, 1870.

Mrs. Cridge's tenth examination.

"I see again the same small vehicles, capable of holding one or two persons, previously described (see Ex. 6). In front is something cylindrical in form, three or four inches in diameter, and in length equal to the breadth of the carriage. This evidently contains the motive-power, as the carriage moves or stops promptly by touching this apparatus on one side. No animals of any kind are used for draught or carrying.

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"I am again in the place where there are so many observatories. I recognize some places that I saw before, and also see some strange faces. I ascend one of the observatories: it faces eastward. I do not understand what its occupants are doing; but they are very busy. Much apparatus connected with telescopes is being used. I look through a telescope, and see a planet; and I see a very large and high mountain, which looks like that I saw in Mars: I believe it is the same mountain. On further observation, I feel confident that they are examining the planet; but they can only see half of that mountain. It is astonishing how much these people know of the other planets.

"The common dress for men is light in texture, and fits somewhat, but not closely, to the form. For dress occasions they wear loose, full garments.

"I perceive that they are again taking pictures of their planetary observations.

"Still I linger, linger here, as if there was something to be learned of especial interest. Concerning the botany, geology, or agriculture of the planet, I know almost nothing. Sometimes I float off, and just begin to catch a glimpse of its geography; and then it is gone.

"There are some thousands of people gathered here: but I see no children; not one. Every thing indicates that this locality is a place to be *visited* by those especially interested in astronomy and kindred sciences; the present being a time of peculiar interest there.

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"The outlines of the land are decidedly picturesque, abounding in indentations, beautiful rivers, and small lakes. Now I hover in the atmosphere, and see the planet as it revolves; keeping myself stationary in reference to such rotation: thus I obtain a view of a large portion of the planet at once; and, by moving myself, I see the whole."

THE PEOPLE OF JUPITER FLOATING IN THE AIR.

"Now I again approach the surface. I see people in a location some distance west of the astronomical city, and a little south of the equator: in this location it is not, I think, as warm as in the city, which is but very little north of the equator. Some of these people are floating in the air for amusement, at times cautiously venturing over the water; but the majority do not run that risk. In this exercise many of them are very expert, appearing to move as easily as on land. They are very graceful in their movements. I have seen nothing uncouth among any of them.

"The water is not salt. I now see animals, some of which come up out of the water near the land.

"I now go to a place considerably south of the equator, on a point of land stretching far into the ocean. The climate is somewhat cold. For the first time I see children, a number of boys and girls, who are dressed in thick clothing, — apparently woollen, — and enjoying themselves very much playing. Some things resembling logs of wood are floating in the water; and the children are jumping from one to the other, exhibiting much merriment. There

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is great simplicity in their style of dress. The boys are dressed in dark clothes, and the girls in light."

DAILY LIFE OF THE JOVIANS.

MARCH 18, 1870.

Mrs. Cridge's eleventh examination.

"To-night I am rather longer than usual in reaching the planet, and can, while on the way, look back and see the earth and other planets.

"I am to-night more *en rapport* with the people than I have ever been before, having a more realizing sense of human spheres and of every-day life. The people are not so frail as we are: they are less 'of the earth, earthy,' and partake more of the spiritual; which to-night, as I never have to the same extent previously, I feel to be the more real. Some of them are inclined to the idea of a Supreme Being. I find in them a sentiment of veneration, of devotion; and yet not an ignorant, dark, blinded devotion, but that which is tempered by an acquaintance with Nature. I do not perceive this by observation of *individual* natures in succession, by special observations, but by sensing the aggregate of human spheres.

"There is so little of the spirit of avarice, grasping, trading, and so much of refinement, culture, and rest!

"And now I find myself in a dwelling. I see a baby asleep. The period of pregnancy is longer than with us, and the children arrive at maturity more slowly. This baby is fair; has a most beautiful profile, blue eyes, and an exceedingly white skin. I begin now to see their faces more clearly. They are much whiter than we are; but it is a healthy, not a sickly whiteness.

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"I am now much farther westward than the place where I saw the astronomical convention. It is daylight. I am in a room: it is constructed beautifully, but simply, and devoid of elaborateness. On the east and west are large door-ways, the upper portions of which are circular: they are closed, when desired, by *slides*, not hinges. On the north and south are two large windows.

"In this room is the child, laid in a cot, provided with something at its head to shelter the occupant from draughts, &c.: it somewhat resembles a cradle. There are women; but, as I cannot describe them in detail, I will go elsewhere.

"I see a large number of rooms connected with each other, yet some or all separated from each other by short halls. In this building is a great number of people, all of whom are perfectly private. The front of the building is an arc of an ellipse in its general outline: that portion of the ellipse not occupied by the building is a large garden, below which is a river. The building is broader and higher in the middle than at the sides."

BUILDINGS AND GARDENS ON JUPITER.

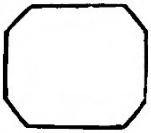
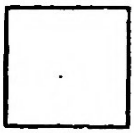
MARCH 19, 1870.

Mrs. Cridge's twelfth examination.

"The forces that so operate on planets as to cause them to move on their own axes have freer action on Jupiter than on this earth, by reason of the smaller specific gravity of the former. I come into *rapport* with those causes, but have not learned their essential nature.

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"I am again in the building last described. There are no sharp corners: right and acute angles are carefully avoided. Where, in our style of building, two walls would meet at right angles, they would insert at the junction a short side to cut off the corner; thus

 instead of 

The same peculiarity is observed in their architectural ornaments, which are by no means elaborate, and are frequently curved; but it does not appear in the *interior* of their rooms, which are like ours in form, except the door-ways.

"The middle portion of this building is higher and broader than its extremities, these being but one room in width, and one story in height; while the central portion is three stories in height. In this place are several of those buildings adjacent to each other, similar in architecture, and arrangement of grounds; that portion of the transverse diameter of the ellipse which is near one extremity passing through the centre of the building, and terminating at its front.

"I descend to the garden, in which there are beautiful walks. The combination of elegance with simplicity in every thing here strikes one most charmingly. I see there are divisions in the land, and more buildings like this, which is apparently the style of the large city here located. The fences dividing the grounds from each other are white. I can pass readily (psychometrically) from one building to another. There are no limed or papered walls. The inner walls are composed of dark wood the color of walnut. The halls are large, and ornamented —

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as are the rooms — with what appears like carved work; but the style is not elaborate. The walls and recesses are inlaid with mirrors; and every thing in the furniture and adornments of those rooms gives one a feeling of rest.

"The staircases are broad; the windows each composed of one very clear, thick, perfect piece of glass.

"I see a girl apparently about five years of age: she is exceedingly graceful, beautiful, and light. The grace of motion in all these people is remarkable.

"At the lower part of the grounds, near the river, I observed means of communication with adjacent grounds, consisting of divergences from the walls, and a sort of bridge; but I could not see whether those bridges were over water or not."

THE EQUATORIAL REGION OF JUPITER.

MARCH 23, 1870.

Mrs. Cridge's thirteenth examination.

"I see that the astronomical convention is still in session. Two moons are visible; and a third is just setting. In apparent size, as viewed from the planet, one is much larger than our moon as viewed from the earth: the other is of about the same size as our moon.

"The people of the convention all look peculiarly happy: they are on the *qui vive* about something.

"I now go westward. There is a feeling of great repose in that part of the planet extending from the equator to about twenty-five degrees north and south. I still go westward. Here is a beautiful country; on the whole, elevated: it is diversified by hill and dale,

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resulting from the action of streams, and, in addition, dotted over by thousands of small, rather abrupt mounds, somewhat conical in form, and from thirty to one hundred feet in height.

"I still keep westward (in the northern hemisphere), and at length reach a chain of high mountains extending from north-north-east to south-south-west. Passing over these, I reach a valley, or plain, extending in length fifteen or twenty thousand miles, and perhaps two or three thousand in breadth, and not much diversified in regard to level. In its very heart, and about equidistant from equator and north pole, quietly sleeps a very large lake. On the west, this large valley, or plain, is bounded by another chain of mountains, running nearly north and south, — a little east of north, and west of south. This brings me about one hundred and fifty degrees of longitude west of the astronomical convention.

"At the equator, and for some distance on each side, the vegetation is of a brilliant green color, varying in shades from dark to light; but, as the latitudes become higher, there is a gradual change both in color and texture, the green being of a yellower tint."

LADIES OF JUPITER.

MARCH 25, 1870.

Mrs. Cridge's fourteenth examination.

"There have been volcanoes which have left outward marks; but, at present, few remain.

"I see some ladies with hair reaching to their waists. For beauty, it hangs loosely; that is the cus-

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tomary manner of wearing it: but, when that is inconvenient, it is loosely plaited, and hangs down. Ease, repose, and a charming simplicity, find expression in every thing connected with these people. The dress is loose, and entirely unconfined, excepting that, in some cases, there is a loose girdle around the waist."

LANGUAGE AND AMUSEMENTS OF THE JOVIANS.

APRIL 22, 1870.

Mrs. Cridge's fifteenth examination.

"As the tone of the voice indicates with us the nature of the emotions which affect the speaker, or the character of the subject of discourse; so the words, the language, of the Jovians, accomplish, in a higher degree, the same end. Simple subjects are usually expressed in words of one syllable; while compound ideas multiply the number of syllables, with some reference to the complexity of the subject. The language there, like languages with us, has a *general* character running through nearly all the words of which it is composed. The sounds are liquid, rippling, mellow, and musical; but the language is by no means wanting, in forcible, energetic, and compact sounds, to express corresponding ideas, or to use in connection with subjects of a corresponding character.

"To-day there is a hazy appearance in the atmosphere; and the warmth, as it lingers in the atmosphere thus affected, is very agreeable.

"Woman here is equal with man, yet different from him. Men are larger than women, but have a

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like fineness of physique, and are nearer to women in the development of the intuitive faculties, and in other respects, than on this planet.

"The proportion of births to the population is less than with us. The period of gestation is longer; but children require much less attention after birth there than here.

"Several times I have seen the people sailing on water. They are very partial to aquatic amusements, including bathing. They manage their vessels very dexterously, and sail them much more rapidly than we do. I see some of them bathing in the ocean. I see vast numbers of the most beautiful shells of all sizes, and of numerous species. Some distance from the bathers, I see fish in the water.

"They use no animal food; not even fish."

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CHAPTER III.

MISCELLANEOUS EXAMINATIONS.

THERE are in this country thousands of persons — women, men, and children — who could exercise the psychometric faculty to advantage, if they only knew how to take advantage of the powers that they possess. Some would succeed best in describing and delineating extinct life-forms: others would succeed well, as many are doing, in describing the internal condition of diseased persons, sensing in themselves, by their sympathetic connection with the disease, whatever peculiar condition might exist. Some would succeed best in describing the heavenly bodies and their occupants; while others might most easily describe the earth's interior, and the position of the valuable contents of her veins. Some see and feel but little; while others feel so acutely, that it is almost impossible for them to examine any thing whose history has been particularly exciting.

One of the most sensitive psychometers that I have met with is Mrs. Clapp of Weymouth, Mass. Her husband, W. W. Clapp, as an experiment, gave her a piece of pumice-stone to examine, and wrote down what she said at the time, and forwarded it to me. She saw the specimen, but did not know its character.

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PUMICE-STONE.

"I hear a roaring noise in the distance, but do not see any thing. Now I am in the water, and it is pouring on me like a waterfall. I feel very quiet now, as if in an eddy. Now the water is rushing against and over me, and is very cold, and produces a suffocating sensation. I am moving down stream, — moving along. Now I am stopped, now moving, now stopped; and the water is pouring through every pore, and out of the ends of my fingers. It is not very deep here; but in some places it is very deep. I stop in shallow water; and then I see a great many pieces like this in kind, but very much larger. I think this must have been formed in the water.

"Now I see a waterfall: it is splendid. The water is pouring down from a great height over a precipice, which is almost perpendicular, — one of the most beautiful sights I ever saw. I am moving from it now. I was close up to it at first, and occasionally get stopped; and then it is that I see large stones like this. Sometimes I can see over the surface to the very edge; and then I go down where there is nothing but water around me.

"It begins to grow warm now: and I feel a kind of suffocating feeling again; only this time it is from heat. Oh, how hot it grows! and how hot and dry the air is! I am almost scorched. Oh, dear! I am hot, and falling. I am in the midst of a shower of stones and ashes. I shall have to give it up; for I am so parched and thirsty, I shall die.

"I see stones coming out of something in the dis-

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tance: they bounce when they strike the ground. Now I see: it is a burning mountain, a volcano! Oh, it is terrible! It is so hot, I can't endure it any longer. I don't get any nearer; but the air chokes me where I am. I am moving on now, and am nearing the volcano, where I see a great deal of rock like this.

"Now I am going round to the right, or what appears to be the west side of the mountain: as I go round it, I see some very large pieces. Now I am amid smoke, I think; for it seems thick and hazy, with something that almost takes my breath. It is so hot here, it seems as if I should parch.

"Now I am going up, up, up. Oh, such a feeling! How bad the air is! Oh, dear! I am fainting! Get me some water! — quick!"

"At this point," writes Mr. Clapp, "her hand fell lifeless at her side, and it was with difficulty that I restored her to a normal condition. She felt as if she was in the air some little time after she was able to speak, and did not get entirely over it until the next day."

Had the history of the specimen been known, it would have confirmed the accuracy of the examination in every particular, I have no doubt. After the stone was ejected from the volcano, as it doubtless was, it seems to have been washed down some stream. The latter part of its history comes up first.

EARLY TERTIARY TIMES IN VERMONT.

In February, 1872, Mrs. Clapp examined psychometrically a fragment of lignite from Brandon, Vt.,

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knowing nothing of the character of the specimen. She said, —

"I feel a cold draught all over my arms. How large I grow! I am very large, and increasing. My arm is so heavy, I cannot raise it. I feel a cold draught over me all the time. I feel a motion, but do not see much. It seems as if I was going through the air, it is so chilly. I am so large!"

On questioning her after the experiment, she said she felt like a tree, — half as large as the room. Her arm grew faster than her body, and seemed to be a great limb swinging in the wind. "I had a glimpse of other trees not so large. Had a sensation of dampness like that of a fog."

A few days after, I received from Mr. Clapp the following, with a note, in which he wrote, "I give you this experiment almost in the exact words, so that you may get at the truth." The same specimen was tried, neither of them knowing the character of it; though the previous examination, and the appearance of the specimen, may have suggested its vegetable origin.

"I feel a cold draught going over my hand; and it seems as if I was waving through the air. I have that big feeling coming again that I had the night that Mr. Denton was here, when trying this same specimen. The air seems warm now.

"Oh, my arm is *so* large! and it aches to my shoulder. I feel a draught all the time. When it first strikes, it seems cool, but grows warm at once. I am growing very large: my body is monstrous.

"I hear a rumbling sound: it struck my right ear

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first. Oh, what a rumbling! And there is a terrible gale, a perfect tornado. It rumbles awfully. It almost jars me. There go some trees over! Oh, how the ground trembles! There! — off goes one of these pieces! Oh! I see the trees come up by the roots.

"Now I am up in the air, — away up. I cannot see any thing but mist. And such a blow! It seems as if I should fall over myself. And then there is such an awful roaring like thunder under me! Thunder is no name for it: it sounds as if the world was tumbling to pieces. It feels damp and chilly up here.

"I am so tall and so large now! It is hard to breathe. There is a tendency from beneath to uproot me. I hear the rumbling all the time. Oh! I am falling over. It gives me a terrible shock."

(Turned the specimen over.) "I can see a great tree that is canted over, and the limbs touch the ground, and others that are smaller than this. The climate is congenial, — mild and pleasant. Should think it was autumn; for the leaves look old and tough. Some of the trees look like elms; but I do not think they are. I do not see any signs of inhabitants. (With the specimen this way, I feel natural.) I can hear birds sing delightfully, but do not see them. I feel it sprinkle; yes, it rains: and the birds make a noise as if frightened.

"The rain makes me feel cold in spots when the drops strike me; and the wind is blowing hard.

"I caught sight of a bird: it looked something like a robin, but had a longer bill. Now I see a great many of them on the ground picking.

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"It is done raining now: it begins to look beautiful. The sun has come out: every thing is wet and sparkling, and the air is sweet and fragrant. The climate is delightful here. The sun is very hot; and my face feels as if it was sunburnt. The shower came quickly, and went as quickly as it came. This is a good place to study Nature in. No fear comes with these surroundings. There are trees all round, and some rocks."

(Changed the position of the specimen again.) "I feel as if descending. I have got away down to the ground. Now I am in the dirt beneath the surface. I seem to be pushing along, and strike a stone occasionally; and that changes my course: it is hard work. Have grown a good size now.

"Now I feel a waving sensation, and jarring, and hear rumbling. Am nearer to it than I was at first. There is an inclination to force me up. I can hear the roots snapping and tearing. I am squeezed by the force below against the dirt on top of me. There is a tremendous shaking that loosens every thing around me.

"Now the noise gradually subsides: it grows calm and quiet now."

"At this point," writes Mr. Clapp, "she became suddenly unconscious;" and she did not recover her normal condition for about an hour.

The most remarkable experiences in the history of the tree seem to have been presented to her, while she seemed to be, part of the time, a branch, then the trunk, and, lastly, a root of the tree. The tree, of which the lignite was a part, had, in my opinion, been

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exposed to some terrific tornado blast accompanying an earthquake; and they had left their impress upon every part of its structure which the sensitive psychometer was able to feel.

AN EGYPTIAN FUNERAL.

In June, 1873, I sent to Mr. Clapp a fragment of a date taken out of an ancient tomb in Thebes, Upper Egypt, having first whittled it so as to destroy all appearance of its organic character. The specimen was about as large as a grain of pop-corn. I gave Mr. Clapp no idea of its nature; and I regard it as impossible that either could have obtained, by the exercise of their ordinary senses, any clew to the locality from which it was taken.

In a few days I received from Mr. Clapp the following: —

"I can see something in the distance that looks like a great hole or door. I cannot see very plain what it is. Do you suppose this is a cave that I am nearing? I can smell a very bad odor from it, that makes me feel sick.

"I think this must be a tomb. I see something that looks like a cross, only the ends of the horizontal part drop like the ends of the letter T." (She drew the shape of the cross as represented by Fig. 107.) "I think it is a religious emblem. The entrance is rough-looking. There is another door, or opening, on the inside of the first one, and a candle burning.

"I can see coffins, strange-looking, and different from ours in this country, — very narrow at the foot, and broad at the shoulders; and at the foot on the

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end is that strange cross. They look as if they were made of some kind of metal. They are black, and do not show any signs of decay. There are a great many in here, all on shelves; and they look as if they were taken good care of. The upper part of the tomb is trimmed with twigs of some kind of green tree, — emblematic of immortality, I think.

"Here comes a procession all dressed in black. Eight men are carrying a rough-looking bier, and on it a coffin, covered over with a black cloth. They are clad in priestly-looking robes, peaked crape caps, and black tape-strings tied round the right ankle of each man that carries the bier. They have placed it in front of the tomb, and are all looking down on it. There are some more waiting at the entrance, or gateway, close by two large stone posts. Four of the eight have each placed a green twig on the coffin, — two at the head, and two at the foot. Now the other four are tying a piece of something black on each twig, and are making motions over the coffin, — bidding it adieu, I suppose.

"Now the rest are marching up to the tomb, and are forming a line on each side of it. Each man places his right hand on his heart, and his left on the side of his cap.

"The eight now carry the coffin into the tomb. They go round the candle, and place the coffin on the ground behind it. The eight are now bidding it adieu in the same manner as those at the entrance, waving their hands from their heads toward the coffin. This is a large tomb.

"They are all going out; and the rest have joined

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the eight with the bier. I watch them moving along in the distance. Now they are ascending a flight of six stone steps into a rough-stone building. They have all gone in; and I am following.

"I am in, and can see the interior. There is a seat all round the hall, boxed down to the floor. It is a large hall; and on the sides there are desks, or something that looks like them; and in the front, opposite the entrance, there is an altar, or speaker's stand; and in front of it a large box. They all march up to it, take off their mourning-regalia, and place them in it. They untie the tape on their ankles, and place that with the rest. They have divested themselves of all signs of mourning, and disappeared.

"These men are not very dark in complexion; very near the color of mulattoes."

Mr. Clapp adds, "This is nearly word for word as she gave it to me."

I have made a very few verbal changes, but have not interfered in any way with the sense, nor made the slightest addition.

After receiving the examination, I wrote to Mr. Clapp, requesting him to obtain from Mrs. Clapp the shape of the coffin that she saw. I received in reply the outline of Fig. 107, which is identical in shape with some of the coffins used in Egypt, but differs considerably from any used in modern times among us.

Some persons might regard the funeral as a very modern one, on account of the presence of the cross; but the cross, as archæologists know, was a sacred emblem in many countries long before the advent of Christianity. There is no form of the cross in use

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at the present time that cannot be traced to a remote antiquity. Among the Egyptians, the cross was regarded as the emblem of life, and was therefore indicative, when placed upon the coffin, of the belief of the survivors in the continued existence of the deceased. The particular form of the cross seen by Mrs. Clapp, though resembling the common cross of Egypt, is somewhat different from any Egyptian cross that I have seen.

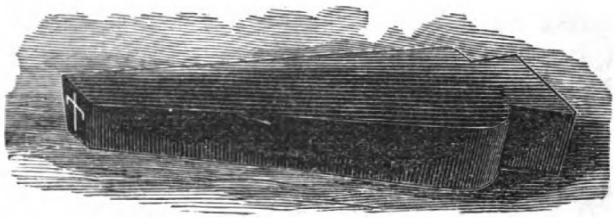


FIG. 107. — Ancient Egyptian coffin.

The funeral that she describes seems to have been connected with the burial of a member of some sacred order; and differs, therefore, from the ordinary Egyptian funerals. The complexion of the Egyptians is very well described, as being "very near the color of mulattoes."

The gentleman of whom I obtained the date took it out of a jar in one of the ancient Theban tombs; and it cannot have been less than about two thousand years old, and may have been very much older.

MAMMOTH CAVE.

With regard to some of these examinations, it will be said that the statements made are such as would

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be appropriate to many different specimens; and of some this is doubtless true: but I think it will be seen that the following is true of but one known place, — the Mammoth Cave. When sailing on Echo River, in that cave, I dislodged from the rocky ceiling a small cup-coral, which Sherman examined in November, 1866, with no knowledge of it except what he might have obtained by seeing it.

"It seems to be all dark: no, not quite dark. It is underground; and there is rock over my head. I have to stoop in places. I can see where light comes in. There is red rock by it. I see roundish holes, with shining things in them. The place looks as if somebody had been to work. It is a good deal wider than it is tall.

"There is a place I go down into, where there is a brook running and foaming through the rocks. It has cut its way right down from the top, I think. It is not a small brook, either. It goes foaming down. I am following the stream. It empties into a large pond, or something of the kind; and that empties into another stream. The land is away above me. The rocks are dripping. It is all solid; but there is some coral-looking stuff on the walls.

"That stream goes away down, with six or seven falls, into a large, broad place. I cannot see the other side of it. I can see the gleam of the water, and the circles made by fishes as they jump up. It is very, very still here, and all I can hear is these fish. There are many crooks to this stream, and sometimes it goes away round.

"There are some animals in the water here that I

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"We cannot see the sky. Every thing seems so chilly and damp and dark, and our voices sound so hollow! We had to come a long way in wagons to get here. There is no railroad near (4). Oh! this is such a large place, it would take a great while to explore it. No one dug this: Nature made it. I see a place away up high with a little bridge across it."

(1.) From Boston, where the examination was made, Mammoth Cave is due south-west.

(2.) She probably refers to the stalagmitic matter which collects upon the walls, and frequently has a moss-like appearance.

(3.) The river that she observes is, I think, Echo River, from above which the specimen was obtained.

(4.) This is a very singular statement. I fancy that she must have come into *rapport* with the condition of some party at that time visiting the cave. There is a railroad within a few miles of the cave.

THE ADELSBERG CAVE, AND HOW IT WAS FORMED.

A friend presented me with a piece of a stalactite from the famous Adelsberg Cave in Germany. I broke off a very small fragment, and gave it to Sherman a few months ago for examination. He knew nothing whatever regarding the specimen, which, he told me afterward, he supposed was a piece of quartz.

"I seem to be in some dark place: it may be a cave. It seems to be an old cave where there have been animals; for I see their bones. It is a stalactite cave. The stalactites are very pretty and slender.

"In one place I see a bone sticking out of the side of the cave, that has been slightly covered with

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rock by water dripping; but I can see the complete form (1).

"There are many bones round here; some as large as a rhinoceros's bone. Water comes down pat, pat, quite hard, and echoes. I can hear it dropping all round. I like it better than that dead stillness that I have noticed in some caves.

"This place is all divided. There are small holes that you can pass through into large chambers. Every thing looks as if it had been done by the best of workmen: it is all beautiful.

"Oh! I see a place immensely deep. There is a chamber, and one side of the floor seems cut away; and there is a very deep place, with a little water at the bottom. I can hear water rushing that I do not see.

"It would be a hopeless position for any one down there. There is a small hole through from there that goes under the chamber.

"I do not suppose that I could find the place where I started from, I have gone round so. In some places the roof is very low, and in others very high. The floor comes up, and nearly meets the roof in some places.

"In one place I see a hill that shines white as if it was covered with snow.

"I see a singular stalactite here. It seems to have been attached, and then broken. (Draws Fig. 108.)

"This seems to be some time back: it is not the present time." ("Why do you think so?") "I cannot tell: only I have that kind of feeling.

"I can hear water almost everywhere.

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"Some of the stalactites are so fine, that they seem like glass; as small as icicles of the same length; and they are quite white and beautiful (2). The water keeps dropping off the ends of them.

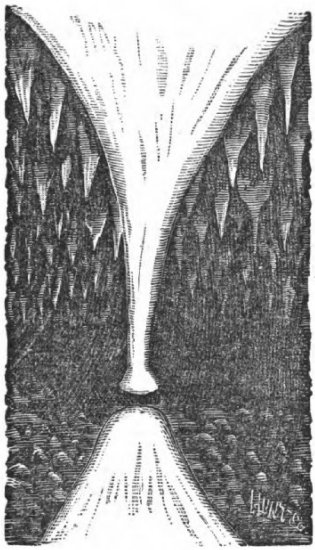


FIG. 108. — Stalactite and stalagmite.

"Now I see something very pretty. I came to the end of a floor, and looked over; and there was a river, about twenty feet down, rushing along quite furiously. If that river should go lower, there would be a room under this. It was running out from under this. As the river goes on, the ceiling gradually approaches it till it almost touches it (3). I put my hand against the rock, and felt it ridgy, as if the water had chiselled it out.

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"Where I am now seems like a new room: the stalactites are not more than two or three inches long."

("Can you go back, and see how the cavern was formed?")

"Well, as I went back, I saw the river rise, till it came up and filled this room, and was rushing through here.

"I see another curious thing. The water has left a rock hanging between two rocks. I will draw it. It is very large, — five or six feet in diameter. (Draws Fig. 109.)

"As I keep going back, I see the water gradually rise and go into a chamber above this. The rooms below must be solid rock.

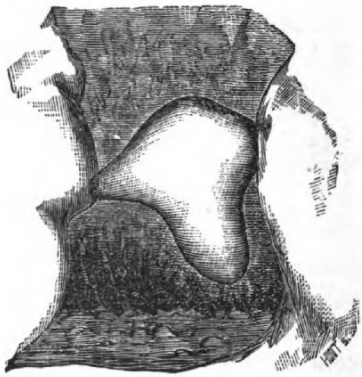


FIG. 109. — Hanging rock.

"Now I must be near the beginning. I see a good-sized stream running along twenty or thirty feet from the surface, nearly straight.

"I can see how it wore the cave out. It struck

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the rock on one side, and ate the rock away; and then dashed over to the other side, and wore away there; and kept sinking all the time. The top is quite smooth: the stalactites made it irregular afterwards. This rock must have been soft, I think (4).

"I see how the bones got in here. It was by the stream floating in dead animals that have been washed from above. I can see them floating round, — a very large bear, an animal like an opossum, with a long tail. It is a pouched animal. They catch in crevices, and stay there.

"Here is a large dead reptile, about five feet long: it is not a crocodile. It is peculiar, and partly decayed; and I cannot get it exactly right. (Draws Fig. 110.) There are scales on it very large in proportion to the size of the animal."

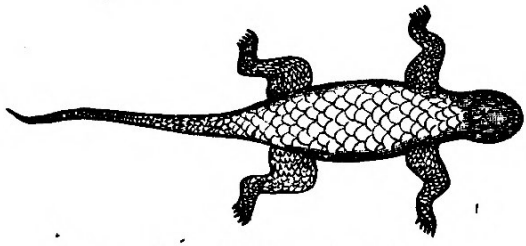


FIG. 110.—Reptile in Adelsberg Cave.

(1.) Fossil bones incrusted with stalagmite have been found in this cave.

(2.) Speaking of a portion of this cave, Reclus says,* "This portion of the grotto, *which appears to have been the former bed of the Poik*, . . . affords won-

* The Earth, p. 257.

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derful groups of stalactites, especially in the Salle du Calvaire, the vaulted roof of which, having the enormous span of two hundred and ten yards, has dropped upon a hillock of *débris* a perfect forest of stalagmitic columns and white needles."

(3.) When this examination was made, I knew but little more than the name of this cave, and could not have told whether there was a river in it or not, still less whether it was "rushing quite furiously;" but Reclus says of this cave, it "is especially curious on account of its size, the variety of its calcareous concretions, and the torrent *which runs roaring through it.*"

(4.) That the cave was formed in this way there can be very little doubt. Hartwig says, "The Cave of Adelsberg is a remarkable example of the changes which the subterranean waters, aided by time or by the disrupting power of earthquakes, may thus bring about: for the Poik now flows beneath its galleries in the same north-easterly direction, in a channel which is for the greatest part unknown and inexplorable; so that the dry cave of the present day must evidently have been the old river-bed." *

He supposes that the rock was softer when the eroding process was going on; but this was a mistake.

THE SIEGE OF GIBRALTAR.

About four years ago, Sherman, looking at "Hume and Smollett's History of England," saw a picture of rescuing Spaniards before Gibraltar, and said he should like to have seen the fight. Said I, "You can;"

* The Subterranean World, p. 138.

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and, taking down an inkstand made of stalagmitic limestone from Gibraltar, I handed it to him. He placed it to his forehead, and said, —

"I hear the guns going 'bang, bang!' It is not much like the picture, though. I see a great many ships. I see the men on the rock loading the cannon, and touching them off. I see the people falling into the water, and hear the ships split and crack as the balls go into them. The balls are hot too, — red-hot as they put them in. I see a little ring of smoke whirling around the ball as it goes. I see one ship tip right over: the sails are dipping in. Men are yelling, and jumping into the water from some, the blaze is so near.

"One ship is nearly full of powder: it has just exploded. The men in the ships have got the worst of it. The cannon-balls are going fast. One cannon has burst in pieces; but I don't see anybody hurt. The water is thick in some places with men swimming.

I see one ship sinking down at the back; and the front part is sticking up. I hear the brands hiss as they fall into the water. I see another ship blow up. A red-hot ball went through the side into the powder-place.

"I see no women. That picture is nothing to it. I am standing where the cannon are. Now another ship has exploded. What a loud noise it makes! It made me jump.

"I see men picking them up, — pulling them out of the water, all wet. One boat full has gone to the shore. I see several little boats now.

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"The cannon have stopped; but I hear the burning logs hiss yet. They take the men to one side of the rock, to a large house. They have loaded their cannon all up so as to have them ready.

"With this other side I seem to be two or three miles off. I see the hump, or hill, and the long strait of water, and the flat place where the cannon are.

"I am close to it again. I see logs floating still; and it smells of gunpowder. If the man had seen it, he would have drawn it better."

(In answer to questions.)

"The cannon-balls were put in with an iron thing that the balls fit into, and fixed with a rope. They swung it, and it hit on the end of the cannon, and rolled in."

The celebrated attack on Gibraltar, to which the engraving refers, took place in 1782, when the combined French and Spanish fleets, consisting of forty-seven sail of the line, ten battering-ships, and fifteen gun and mortar boats, opened their guns, and poured in their broadsides, doing much damage. The defenders resorted at length to red-hot balls; and, after some hours, the ship of the Spanish admiral was in flames, every one of the batteries was finally burned, and the Spaniards lost at least two thousand men. The British rescued many of the Spaniards who were in danger of drowning in consequence of the destruction of their vessels. It might be supposed that I had given Sherman some account of this previous to the examination; but nothing had been said beyond the merest mention; and it was not until the examination was over that I knew that red-hot balls were

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fired by the British into the vessels of the attacking-party.

SAVAGE MAN IN EUROPE.

Many representations of primitive humanity have been given in this volume: but one of the most interesting, and one that represents man at a very early period, I neglected to insert in its proper place; and I therefore give it here. The specimen is from Switzerland, near Lake Concise, and was examined about four years ago.

"I see a large lake: I am near it. The bushes grow into the water all around it. It is very muddy. A very large mossy rock sticks up above the trees in a swampy place."

("Find the people, if you can.") "I see one poor fellow now: he is walking along. Now he sits on a rock, and is throwing stones into the lake. He has long hair, especially under the arms. He looks a good deal like a monkey. His mouth sticks out. A monkey in a tree is mimicking him. He gets mad, and throws stones at the monkey; and the monkey throws at him. The man is of a brownish color. He has no beard except a few bristles; but his body is hairy nearly all over.

"The monkey hit the man on the face, and he has not hit the monkey yet. Didn't the man jump! He went back up to the middle in mud, and saved himself by a branch. What a figure he is! He is running now. He wades into a pond where it is sandy: he swims dog-paddle way. He is a good swimmer. He dives, and goes quite down to the bottom. I can

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see him: he is diving after fish. There are fish that swim slowly like a turtle. They dive into the sand; and he puts his hand down, and catches them; and I see him now swimming on his back, and eating them." (The specimen was a mere fragment; and it slipped out of his fingers, and could not be found. However, on taking another fragment, he was able to continue the description.) "Now he is diving again. After he catches one, he touches the bottom with his feet, and jumps. I can see him from the top of the water: it is clear. As he swims, his eyes are under water most of the time; and, as soon as he sees a fish, he dives. There is a kind of flat-fish that goes sideways into the sand. He eats them as fast as he catches them. He swims very easy. He is going to the land. Now he is out, and is going on, scratching himself. He saw an animal about the size of a squirrel run into a hole; and he is digging after it with his nails, like a dog. He has got it by the tail, and is pulling it out. It tries to bite him. He twisted its head round; broke its neck; and now he is eating it. He relishes that more than he did the fish. He is sucking the blood out, and drinking it: it twitches while he eats it. He has eaten it all but the skin and bones. He goes like the chickens when their crops are full.

"The muscle on his arm is as large as my two fists. He acts as if he was drunk, he twists about so. He takes a big stick with thorns on, and scratches himself, and rubs his back against a rough-barked tree, like a pig, till he is satisfied. He is short and stout, broad-shouldered and strong.

"He is going through bushes to a miserable hut

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underground. It is a nasty place, made of sticks, with mud plastered over it. There are twelve or thirteen in there, and he is talking to them. They make a great many motions. There are three little children, and five women. They have stones to sit on, and dry leaves to lie on. They have something to dip water with: it is made of clay, baked in the sun, I think. It does not look burned. The climate is very warm, hot."

CHURCH OF ST. CLEMENTS, ROME.

The following examination by Mrs. Denton of a fragment of marble from the Church of St. Clements, the oldest church of Rome, will show what a wide range the psychometer may obtain from a specimen, and what an accurate analysis of the character of a people may be obtained from the dumb rock. Specimen entirely unknown to her.

"I see a steeple, — now several, — a dome, and towers. I see a city. I seem to be up where I am looking on the tops of buildings below. I am on a level with the tops of some, and below the tops of others.

"I think it a city or large town among hills. It seems to be a pleasant, hilly country, not mountainous. There is a stream here, and buildings on both sides. There is quite a valley here.

("I seem more inclined to examine the natural than the artificial condition of the place.)

"There is a high state of cultivation among the people in certain directions." (Long pause.) "They seem to me to have reverence, devotion, and ideality

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unusually developed; but I cannot tell the direction they take. They affect their government to some extent, and, I think, their religion. There is a strong disposition to look after the interests of this place, and of all connected with it.

"There is a large region that the people of this place are connected with, and have great influence over. I feel this influence extending to other places at a great distance; but it is not so absolute there as here: I mean it is interrupted there by other and often by antagonistic influences. This may be the place where the government of the country has its seat; but the religious ideas of the people are associated with their ideas of government and of the administration of government.

"I have before felt an influence similar to this. They must be quite a religious people.

"I look over the country, and see roads winding about among the hills, and converging here. It seems to be the centre for a great extent of country, like a place of particular interest to the people of a large territory; and people in distant countries seem to feel themselves connected with this place by their religion and by their ideas, if not by their forms of government. It is at once the governmental and the religious centre of a large people. Connected with their regard for this place as a centre of, at least, their political and religious life, is a feeling of intense devotion and of unshadowed illumination, as if here, without any shade of doubt or any possibility of question, were at once the light and the hope of the whole world. They seem to have considered

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themselves immeasurably removed from all other nations and peoples. As a people, their faith in their own as being the true mode of worship is the most implicit conceivable. They do not seem even to suspect the possibility of there having been any mistake in this particular.

"There is here a great deal that is rich and imposing in architecture and in all the regulation of public affairs. I cannot divorce the government and the religion: they seem to be one. I think of no place but Jerusalem where this is so; and yet, in some respects, it does not seem at all like Jerusalem.

"There is here a feeling as of constant care and of untiring effort, like the care and effort requisite for the regulation and maintenance of order in a family (only in this case it is over a people), as if to them had been delegated supervision over a whole country.

"I think this is a large city. I feel an influence that makes me think it is Rome. I hear the chime of bells. This Romish influence appears to come to me through the imposing style of all connected with the religion and the government."

FISH DURING THE TRENTON PERIOD.

Geologists know very little about the fishes of the Silurian times. That they existed during the deposition of the upper beds there is no doubt; and that they existed during the deposition of many of the lower beds would be regarded, I think, by most geologists, as probable: but we hunt over miles of limestone, slabs of shales and sandstones, and look in vain for any evidence as to the character of the ver-

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tebrate ocean-tenants of those very ancient times. The case is very different when psychometric vision is brought to bear upon the smallest fragment of rock from the Central or Upper Silurian beds. The following examination was of a portion of *Isotelus gigas*, from the Trenton limestone of Trenton Falls, N.Y.: —

"I see some very small animals swimming about in the water, that look like shrimps. There is a good deal of very fine red sea-weed. There is a crustacean, something like a lobster, crawling along at the bottom of the sea. (Draws Fig. 111.) It has four small legs, and one large one, on each side.

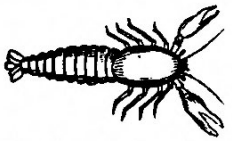


FIG. 111. — Lobster of Trenton period.

"Some small fishes, about three inches long, are swimming near the bottom. They are chubby fish; have no scales, but seem covered with warts. (Draws Fig. 112.) They have small blunt teeth.

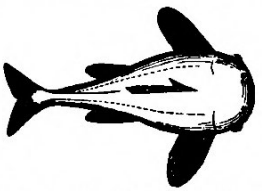


FIG. 112. — Fish of Trenton period.

"I can feel every wave down here; though I think it is twenty feet deep. Every thing feels it: it waves

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the sea-moss back and forth. Another of those crustaceans is here."

EARTHQUAKE ON HAWAII.

As I have already intimated, great caution is necessary in drawing conclusions from what is seen by psychometers, and especially in reference to time. When the first geographical examinations were made, I supposed that what was seen by the psychometer was what would have been actually visible to a spectator standing on the spot at the time; but I found that this was not at all times the case, as the following experience demonstrated.

About three and a half years ago, I was desirous of having Sherman investigate the Guano Islands on the South-American coast, and, placing before him a map, asked him to go and visit an island which I pointed out. He said in a few seconds, —

"I am there. I can go quickly when I please; but I could not see any thing when I was going. The wind is blowing tremendously here. It lifts trees forty feet high, and drives them into the ocean. Some birds are trying to fly against the wind; but, though they fly as hard as they can, they make no headway. They are fish-birds.

"I am on a small island a mile broad. The land is very level: from the ocean it hardly rises a foot in six rods. There are no people here. There are a great many trees on the island. The waves come up so high, that they leave the ground nearly bare behind them."

("Go north.") "I am on a larger island now; I

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should think, twenty miles across. (The wind stopped as soon as I got away about ten miles.) This looks a great deal better; but there are not so many trees."

After describing this island and a neighboring one, we conversed for a little while; and I pointed to Hawaii, the largest of the Sandwich Islands, and asked him to go there. As I knew that he did not know the character of the island, I thought that a discovery of Mauna Loa or Kilauea, two famous volcanoes on this island, would furnish an excellent test.

"I had got nearly back here while I was talking.

"I am up so high now, that I can see from America to Asia. Oh, there is a host of islands! The sea has not lost its color even this far off.

"I have got at it, I am almost sure. It is longer than wide, and very crooked on the edge.

"Oh! there is an earthquake here now, and the trees are shaking. I can see the ground going down near the ocean, or the waves going down: I don't know which. It is not a very bad earthquake, I think; but, as the earth shook, I saw a pebble that lay on a flat rock roll back and forth. Little shocks last about a second, and then longer ones.

"I can see great waves going out from the island like a moving wall on the still ocean all round. The earthquake is just on the island.

"There are so many birds in the air, that one can hardly see the sun, — all kinds of birds, big and little.

"I was lucky to catch it just then. Every time the island gives a jar, a wave goes out, and keeps dwin-

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dling away, as it goes, to nothing. It goes like a rope when you shake it. I do not see that any thing on the island has fallen. The birds are beginning to settle down. I can see where cracks have been made in the mud near the shore five or six feet deep."

("Go down and see what causes the earthquake.")

"Oh! it is very rough down there. Don't the lava dash! There is a great hollow place above the lava, that looks miles high. I can see the light shine on the rocks. When the lava goes down, steam rushes down; and, when the lava comes back, it drives the steam up again. Don't it roar! It seems as if I could put my hands on the lava, and feel it. The lava is close to the rocks everywhere except this place, and the rocks are soft as pudding. It looks horrid down there, — worse than any hell I ever heard of. It seems as if the steam was trying to push the lava down, and the lava to push the steam up; but the lava is the stronger.

"I see another hole, and there is steam in that too. I should like to know how the steam gets down there. I cannot describe it: nothing can describe the way it looks. I have come to a place where the lava is calm; and there is quite a space between the lava and the rocks, and no steam either. I want to get out of it: it makes me jump. I realize it more than I used to.

"I am out now. I am glad to see the ocean. The sea is all calm now."

I came to the conclusion that he had struck the island during an eruption, probably, of Kilauea, but thought it best to obtain some independent testimony of this before giving it publicity.

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Mrs. Denton, the same evening, went to the island, after looking at the map, knowing nothing of Sherman's examination. After a few minutes she said, —

"I seem to be a little way from it. It seems as if there was some electrical disturbance that kept me off it. I do not believe that I can get on it; and I do not think that I should like to remain long, if I could. It does not seem safe. I get no more than a general influence."

Mrs. Denton subsequently examined the island, and saw an eruption of Kilauea; but the notes of that examination I have mislaid. Feeling sure that an eruption was in progress in Hawaii, I told a few friends, and looked with great anxiety for news from the Sandwich Islands. But weeks and months passed without any earthquake-news from Hawaii; and I came to the conclusion, at last, that they had obtained a psychometric view of the island in one of its disturbed conditions, when it seemed so real to them, that they were unable to distinguish it from the present.

COAL-MINE NEAR PITTSBURG.

W. W. Robbins of Milford, N.H., having read "The Soul of Things," resolved to try a psychometric experiment with a sensitive lady of his acquaintance, Mrs. L. A. Bartlett. He sent her, by letter, a small piece of micaceous sandstone which he picked up on a hill opposite Pittsburg, from which there is a fine view of the city and river. In reply he received a letter from her containing the following statement: —

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"I see quite a wide stream of water and a very large flat rock. The edge seems to project over. The soil looks black, as though there was coal mixed with it. What seems to be the back of the rock is very steep, but very rough; and at the bottom the dirt looks like coal-dust. I see trees unlike any I ever saw, with long stems, and little leaves coming out on each side. Some of the trees are quite tall (1). It seems to me that some time the rock had been buried in the earth, and thrown out by an eruption (2).

"A sadness seems to come over me, as though some one working near got buried, or some accident had happened that caused great confusion. I see a lot of men with spades, or something of the kind, as though they were going to work.

"The air seems more invigorating than it does here. It seems as though I could almost taste it. The stream is not very near the rock. It looks dark and muddy.

"I see a hole that seems to have been dug out, — a sort of cave. It does not go into the rock straight, but slants down a little."

In her letter to him she says, "I enjoy *reading* very much. It is next to travelling. It seems so real to me! I can almost fancy myself at the very place at the time."

(1.) Mr. Robbins was of the opinion that these were locust-trees, which he says grow there, and which the psychometer had never seen.

(2.) What she saw was accurate to the letter, I have no doubt; but her conclusion from what she

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saw, in this case, was faulty. What she supposed was thrown out by an eruption had been taken out by the labor of man.

Mr. Robbins informs me that the hill from which the specimen was obtained is near the junction of the Monongahela and Ohio Rivers. The Monongahela is a muddy stream such as she describes. There is a coal-mine six or seven rods distant from the spot where the specimen was picked up; and, on inquiry, he learned, that, six or seven years previous, three or four men were buried in the mine by the falling of the roof.

LEAD-MINE, GALENA.

The most common explanation of psychometric phenomena that is offered is mind-reading. Many persons have said to me, "I can tell you how it is done. You have an idea of what the specimen has been associated with; and the person who examines just runs off on the line of your thought." Those who have read the first volume of "The Soul of Things" will know the futility of this pretended explanation. The following experiment, which is only one out of many similar that I have tried, will show that it does not explain what Sherman sees.

On March 11, 1867, fragments of the following specimens, placed in small boxes, were shaken together; and Sherman with closed eyes picked out one, and placed it on his forehead, no one knowing what specimen it was till the examination was nearly over, when I looked at it; but he did not know till he was done.

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Nodule, drift-clay, Ottawa. Plaster, Cicero's house, Pompeii. Limestone, Mammoth Cave. Meteorite. Head of sperm-whale. Oil-bearing coral. Lignite, Brandon. Handle of deer's horn, Swiss lake. Mummy-cloth. Elephant's tusk. Fossil-wood, Colorado. Seaweed. Hornstone, Mt. Olives. Silver ore, Washoe. Gold ore, Australia. Fish-tooth, mountain-limestone. Manganese, New Brunswick. Zeuglodon. Tin ore, Arizona. Coal-shale, coal-measures, Rhode Island. Shale, Albert mine. Common charcoal, and sulphuret of iron, Marsden lead-mine, Galena. In all, twenty-three specimens. The specimen examined was the last on the list.

Instantly he said, "I am in a large mine; and there is something like copper on the side (1). The men are digging with pickaxes. They have lights on their heads. I hear the pickaxes pick, pick. I see a cart, into which they put large lumps. It goes out slanting from the mine. There is a shaft, and an opening up to the surface (2). I can look up. It is a good way. I can see a black streak in a rock, and there is shiny stuff in it. A cart-load just went out.

"Just then there was a great blast. The mine is full of smoke. It shattered off a good deal of that that looks like copper. The men all ran and hid behind rock while it went off. They have gone up to it now. Another went off in another part of the mine. It shakes the ground underneath when it goes off. The men have their pickaxes, and are going at it again. They made a hole in slantwise, instead of straight down. It blew off a long piece of rock; and they are breaking it up. A piece fell off just

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then, and knocked a man's hat off, and his light out. It buried the hat. A good way off, the lights look like stars in a dark night. I can look outside, and it is all sunshine. The stuff they get out is kind of blue and bluish-yellow (3). I cannot see it clearly down there. I can see some green specks in it. It seems pretty rich." (I looked at the specimen.)

"I looked in from the outside. It is very dark, — as dark as pitch. I saw a fuze burning; and then off it went. It lighted up the mine so, I could see the ore. A man just came down in a bucket. He has a light on his head. The buckets are not lifted up by hand: an engine pulls them up with a wheel. It turns, and that winds up the rope" (4).

(1.) There is in the mine a great deal of sulphuret of iron, which incrusts most of the galena.

(2.) There is a shaft, and also a slanting passage, down into the mine; or was when I was there.

(3.) The galena is, of course, blue; and the sulphuret of iron is a golden-yellow.

(4.) There was an engine drawing up ore in the way he describes.

The fragments examined were small, and entirely unknown to him; so that I know mere feeling of the fingers could have conveyed very little idea of their character to him: yet the examination exactly fits one of them, and one only, and that one the specimen that was examined.

On another occasion he tried a specimen from the same mine when I knew its character; but he was still ignorant of it.

"I see the mine. There is a place as big as this

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room. I see buckets going up and down. There is something black in them; but I don't know what it is. I know now: it is lead. The miners have lights in their caps. They shine like stars. I see a crack. There is a good deal of this lead in it. It is all covered with yellow stuff. Farther up, there is a lot of little cracks, with some in.

"Now I am on top. They take it from here with wagons to where they melt it."

A CALIFORNIA GOLD-MINE.

JULY 5, 1870.

A specimen of sulphuret of copper, taken from a California gold-mine, was examined by Sherman. He saw the specimen, but was told nothing about it.

"I see a farmer ploughing. He picks up a piece of rock, and is looking at it. He puts it in his pocket, and goes on ploughing. He shows it to his wife at dinner. He is half crazy over it. He says his fortune is made.

"I see him bring some men with drills. They have a tip-cart, and make a road right through the corn. They have got out a cartload. The farmer has a magnifying-glass, and is looking it all over carefully, and slapping his hands on his knees now and then.

"They are blasting now. The vein goes down slanting, and they go down on it. The farmer says, no wonder his corn did not grow well on that place. It is a great deal richer farther down; but then it gives out. Another kind of rock comes in and cuts it all off. The mine is in the richest part now, and very near the place where it is cut off."

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A VEIN OF MANGANESE.

About eight years ago, I visited a very interesting locality in New Brunswick where a vein of manganese was exposed in the face of a cliff, on the shore of the Bay of Fundy. I broke off a small piece of manganese from the exposed mass, and, on my return, submitted a small portion of it to psychometric test. The specimen was unseen by Mrs. Denton, and its character entirely unknown.

"I see a vein that looks like iron: if not, there is a good deal of iron about it. The vein is long, and pretty deep. It must be six or seven feet wide in places. In some places the ore is cut off by rock; but the vein continues beyond still thicker. I do not know but it is manganese on the other side. Yes; and it is rich. There is not much iron in it there. There is a large body of it; and it extends as far as I can see.

"It is curious: I can only go one way. It seems as if it existed the other way; but I cannot go to it. It seems like a mist on the other side. I feel it there, and sense it; but I look, and it is gone. How singular! It has been on the other side some time; but it is gone now, and has just left its influence.

"I see now what has done it. It has been washed away. I seem now to feel the influence of the sea. The sensation produced by the absent material is very peculiar. It is faint and shadowy.

"In one place, a rock comes up into the vein; and, were they to sink there, they would obtain nothing. This rock divides the vein; and there is a large body

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on both sides. It is, perhaps, seventy-five yards from the sea. Where it comes up, it divides; and there is a little manganese between."

The sea has evidently washed away a portion of this vein, as she describes. Whether the remaining portion of the vein is as she describes remains to be proved, as I am not aware that it has yet been worked.

When the difficulty of measuring the depth at which mineral deposits lie has been overcome, I have no doubt that psychometry will be rendered available to develop those deposits of wealth that lie beneath our feet waiting for our appropriation. Psychometers should be carefully trained for this special work.

THE PARAHLAMOOSH RANGE, COLORADO.

West of the western range of the Rocky Mountains, and just beyond the Tumbianaro valley, is a very remarkable range of mountains, which I found to be over thirteen thousand feet high, and composed of alternate beds of lava and sandstone. Towards the Tumbianaro it presents, in places, precipitous cliffs of immense height, that show the action of eroding agencies, at some past time, on the grandest scale. From the summit of one of the highest peaks in the range I brought a portion of vesicular lava, which was examined by Mrs. Denton seven years ago, she knowing nothing of the nature of the specimen.

"I see a valley cut out by water, and high hills above it. There seem to be very high and naked cliffs here; and they are peculiar, — different from all

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I ever saw. Cliff seems hardly a proper name: they are more open in places than cliffs generally are. They have been cut away by water a good deal. They are more solid as I go back in time. What a region that was! It is so barren from one end to the other, that I cannot see a thing in the shape of vegetation. It was a remarkable upheaval that produced that range. It shakes from one end to the other. It has been twice the height it is now. It is tremendous. Think of miles of solid rock parted, and then coming together with a crash! It does not seem necessary to go back to hear it. I can hear it, here and now, shaking for hundreds of miles, rocking, crashing, and trembling for a long time. There is a long and comparatively narrow portion that is particularly agitated. It probably caused upheavals in other places.

"I can see as many as a hundred cones sending out smoke and fire. What a condition of things! They are all in action at the same time, like so many chimneys over a great fire. The motion has ceased, to a great extent, since these openings were formed. It is an enormous distance from the under-surface of the overlying rock to the fire below. The fire, the melted matter below, appears to be kept in place by enormous pressure of gas and steam between it and the rock above. When the gases had so accumulated that they could no longer be confined, the upheaval of this mighty mass was the result. These cones, or chimneys, have, in a great measure, been formed since then by material deposited by the escaping gases and steam through rents or openings

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left in the rocks after the disturbing forces had, in a measure, subsided. Again and again, however, have the accumulating masses around those openings been torn away by the fury of the forces below; and new cones have again and again been formed by long-continued and more peaceful action."

THE EARTH'S INTERIOR.

With a specimen of gold ore from Briggs Mine, Colorado, Sherman gave the following. He knew that the specimen was ore of some kind.

"I see something that looks like gold in a white rock. There is a great deal more of yellow ore as it goes down. The pieces grow larger, till it is nearly all ore.

"The vein starts at the top, and cuts right through the rocks. It is quite broad.

"I can see lava now. The vein goes down a long, long way, and keeps getting richer as it goes down. It goes down almost to the lava; but it is awful hot, and nobody could stay there. Some of it is melted. All around the rocks are cracked, and there are great hollow places. All I can see is the red-hot rocks.

"There are different kinds of substances floating in the lava, — all kinds of metal mixed up. One kind looks blue. There are places where it has tried to come up, but could not, — big holes. The lava blinds my eyes."

("How far is it down?") "It's more than one mile.

"The lava boils up, and seems to try awfully to get out."

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("What color is the rock above the lava?") "Above the red, the rocks are a very dark green. There are holes miles up. I see a great deal of bright yellow stuff. I think it is gold: it is very pure.

"The vein is of enormous width deep down: it seems to be a mile wide.

"I see other veins all round here, going straight down."

The mine is in the heart of one of the richest gold districts of Colorado, and is surrounded with gold-bearing veins.

A JOURNEY THROUGH THE PLANET.

Working in the garden in June, 1868, Sherman said he could see readily. As I had no specimens with me, I took him into the cellar of our new house, which was near, and said, "Go straight down here, and tell me what there is under."

"There is a fine bed of sand, and then gravel under here: there are lines of dark-colored sand among the light. Under that it is all trap, then slate (1) and thin yellow rocks, and then granite that is awful thick. It keeps getting warmer and warmer as I go down, then hot and red-hot, and then lava." ("Go down through the lava, and see what there is on the other side.")

(Pause.) "Oh, but it is a long way! I am not through yet. I cannot see any thing in the lava. Going through this is like having the nightmare. I have got to granite on the other side (the granite goes all round). Above that is a kind of black rock, very thick, but not very hard: it is a kind of slate. Then

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yellow rock, and a big bed of sandstone: above that is a little trap; and right above that native copper in chunks and lumps: there is a great deal of it. I come to hollow places that glisten: I don't know what is in them (2). There is trap above that, and copper again (3), and then mud-rock, that splits very easy, with fossils in it. Above that is a very hard rock like flint, and then a rock full of holes, and then dirt to the top.

"Oh, what a pretty country! There are houses with bells all round; and, when the wind blows, they ring. Some are like tents, and scalloped all round, and have pictures of animals on them, — lions, eagles, elephants, and things. I see fishermen all along the shore of the ocean" (4).

(1.) Sand and gravel occur immediately under the soil, and reach down to a considerable depth: trap deposits and slate beds occur in the immediate vicinity.

(2.) These may have been geodiferous cavities, and the crystals in them the objects that glistened.

(3.) His statement of the occurrence of native copper with trap is interesting. He could not have been acquainted with the fact that native copper is invariably found in that connection.

(4.) Had he passed through the planet in a direct line, he would not have found the shore of the ocean; but it was hardly to be expected that he could. The country that he saw may have been China or Japan.

Did he, then, really pass in spirit through our globe? I believe that he did; as I also believe that my sister, Anne Denton Cridge, went down to the fluid interior

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of the planet some fourteen years ago, as described in the first volume of "The Soul of Things."

A CALIFORNIAN DIAMOND.

The high esteem in which precious stones have been held in all known ages has not, perhaps, resulted entirely from their beauty. I find that psychometers love the influence that proceeds from crystals generally, and more especially that of those generally designated precious stones. The following examination was from a Californian diamond, known to be such by the psychometer, Mrs. Denton: —

"I love the influence of this. I am where this came from. I see a yellow diamond as large as a robin's egg: it is very clear. I see a number of brilliant white ones. They are in a kind of crevice. The yellow one is in the rock. I do not think it is far from the sea. It fairly electrifies me. I like the influence better than gold. The yellow one has a delicate tinge: it is the largest I see. They are not very deep in the rock." ("How are they formed?") "I do not believe they belong there.

"What I see cannot be right. I see as many as a bushel of all sorts and sizes; but some of them, I think, must be worthless. They are dark, — some with black spots and specks, and some all black; some few as large as the yellow one, and clear; but some dark ones are very large. They do not lie in a heap; but they are connected: they are in one crevice, and near together. The yellow one I first saw seems absolutely pure."

The theory that attributes diamonds to the crystal-

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lization of liquid carbon — the gas made liquid by pressure — seems to be the most probable. Their natural condition is probably that of crystals in cavities of metamorphic rocks. Their hardness having preserved them from destruction during the erosion of ages, we find them generally in beds of gravel, and conglomerate rocks formed of gravel.

DEPARTURE OF THE SPIRIT FROM THE BODY.

What light does psychometry shed on that still dark page of "Nature's infinite book of mystery," — conscious, individual existence after death, and the condition of man in that next state of being? Our researches have been confined almost exclusively to the material side of life; and yet, on several occasions, spiritual existences, apart from ordinary psychometric forms, have spontaneously made their appearance.

About seven years ago I took Sherman into a dark closet, and held a magnet up, and requested him to tell me what he saw. Instead of seeing light streaming from the poles of the magnet, as I supposed he would do, he said he saw a man; and, on describing him, I found the description to agree exactly with that of my father, whom he had never seen. He at the same time said that he could hear him speak; and repeated to me, as from him, what appeared to be very characteristic expressions. At the same time he accurately described my mother, whom he had likewise never seen.

A DYING EGYPTIAN.

Some days afterward, when examining the *shabti* from Thebes referred to in Vol. II., he said, —

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"I see two men: one has no shoes on; and the other has something tied to the bottom of his feet. They don't wear much clothing. They are homely-looking, and have very short and stiff beards. I see two old women that have more clothing than the men: they look sober, and they are a sober people.

"I see one man ready to die: he lies on a flat place, and faintly groans. Nobody appears to notice him. A man is running up to him. He is dead. The man commences to mourn over him, and kind of pray.

"I see the man's spirit standing still over him. It looks better than the dying man. It stands up, and looks a great deal better than the man. It mumbles something that I cannot understand; seems to talk with me. It points upward with a finger. He was walking, and fell over and died. The spirit is a little higher now, — about as tall as I am above him. It keeps rising and rising, but slowly. Now it darts away quickly, and I cannot see it. It went like a flash (1).

"He has come back now, and three with him. He is showing them his body. He talks more distinctly than he did. He points to his body. They are dressed much better than when alive. He seems glad he is dead. They have white thin clothes on. They are all talking away. I see numbers now not far from there: they seem talking to him. One slowly vanished: I saw his feet last. He went like snow before a hot fire, or lead in a furnace. The man that died is looking all round for him, and the others are laughing at him. They seem to have a jolly time. Why, they can go anywhere!

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"I can see a mischievous spirit: he could make a hand, a large one. They seem to be looking at me and touching me (2).

"The one that vanished has returned.

"I can see through the spirits. I can touch and feel that mischievous one. I cannot see through him. He is almost like a man in the body (3).

"Men are digging a hole for that dead man's body: it is easy to dig. There is no wind: all is still. They dig the hole about five feet deep.

"These spirits did not look like those I saw the other night" (my father and mother): "they look like stones compared with polished diamonds."

(1.) Several independent clairvoyants have described the separation of the spirit from the body in a very similar manner.

(2.) I cannot account for such statements as these. I give them, because to leave them out would be to deal unfairly with the reader, and unjustly with the facts.

(3.) Some spirits appear to him, as they have to many spiritual seers, very much coarser than others: and he says that physical manifestations can be made by such spirits much more readily than by the more refined; which is, I think, very probable.

Some years afterward, I asked him to find a dying man, and watch carefully the process of the separation of the spirit from the body.

"I can see some one dying. There is something eating his heart away. I see a hole on one side. People are round him, and a minister is praying. He feels well. He does not stir at all. His heart beats very slowly.

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"I see his heart commencing to be green. It beats more slowly still. They question him; but he does not answer. He is getting cold. His heart stops a while, and then begins again, but fainter every time. Now it only beats once, and stops a long while. It does not beat at all now; but he is not dead. I can see the blood circulating, and his lungs going a little, and his pulse beating; but his heart has completely stopped.

"He was injured: a rib broke, and a piece stuck in his heart. His eyes are almost half open."

("Can you see his spirit?") "I do now. Why, he is not dead yet! his spirit has not left his body. I see a great many spirits; and he is looking up to them. He is rubbing his eyes, just as if he was getting up in the morning, and laughing at the minister, and trying to call his attention, moving his hand before his face; but the minister does not see him.

"The doctor says, 'He is dead.' When the spirit left, it struggled a little: why was that? They don't go off anywhere. Many of them are round the house. Don't he feel nice now! He is dancing around quite lively. He is talking about his mother that he has left: he is afraid she will suffer. They tell him he is tied to his mother's apron-strings.

"He is trying to shake hands with a man he knows; but the man never notices him. He asks him if he has got the floor done. He hardly seems to know that he has left the body. He meets a number, and tries the same; and he is feeling of himself, and looking at his hands, and seems to be surprised.

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"He is clean: he left all the dirt behind. He has no nails nor hair; nor has any of them. Their heads look curious (1).

"I can see them turn over. This one says he dare not, and they laugh at him. I see them go to a library. They are looking at the books. One of them takes up a Bible, and puts it down again, and says, 'I don't want that book;' and the rest say the same. The book don't move; but he seems to hold it in his hand. Every thing must have a spirit."

(1.) This I do not understand.

THE GREAT PSYCHOMETRIC REALM SEEN.

The question is often asked, Where are all these things that the psychometer sees? The following, unexpectedly seen by Mrs. Denton, may shed some light upon this question. Can this be the realm into which the spirit is ushered at death? or is there a still more interior realm, from which we receive echoes occasionally, but of which we still know so little?

"I am in a different realm from any I have ever before observed. I have to become positive, not only to outward surroundings, but even to the psychometric influences usually received, in order to distinguish this. Yet it appears like a realm of real, substantial existences, stretching back, and backward still, almost interminably, into both time and space.

"I see forms, — people, and the results of their labors; even the very efforts that produced the results. At first I thought it a species of mirage. It seemed like a picture of all that had ever been; yet now it

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seems to me that I could step from this planet upon that world (I can call it nothing else), and travel back through all the scenes that have ever transpired in this.

"What a difference between that which we recognize as matter here and that which seems like matter there! In the one, the elements are so coarse and so angular, I wonder that we can endure it all, much more that we can desire to continue our present relations to it: in the other, all the elements are so refined, they are so free from those great, rough angularities which characterize the elements here, that I can but regard *that* as by so much more than this the real existence.

"Something appears to me to be continually passing from our earth, and from all existences on its surface, only to take on there the selfsame form as that from which it emanated here; as if every moment as it passed had borne with it in eternal fixedness, not the *record merely* of our thoughts and deeds, but the actual, imperishable being, quick with pulsing life, thinking the thought, and performing the deed; instead of passing away into utter nothingness, that which is *here and now* forever continuing, an eternized *there and then.*

"That portion of this realm which represents our earth and her history appears to occupy that portion of space through which the earth has heretofore passed, — her entire pathway since she became an independent member of the solar system. The form, however, as it looks to me now, is not that of a sphere, but that of a broad belt, or zone, endlessly

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waved, and gently curved in its general outline as it stretches back into the eternities, where it eventually appears divided; as if two streams which had for ages held a separate course had met at last, and 'mingled into one.'

"This realm appears to me to be illuminated by the same light as that by which all things are psychometrically seen."

There appears to be a spiritual universe as well as a material one, — a universe that contains all that is, as well as all that ever has been. There are the mountains that were levelled before the Alps and the Andes left the ocean-bed. All the rivers that ever ran are there, — the pellucid rills dancing down from the woody hills, and the muddy streams that poured their turbid waters into lake and ocean. There are the coral-polyps that built their stony trees at the ocean-bottom, and the sea-lilies, whose stalks "bent like corn on the upland lea," where our proudest cities are to-day. All the flowers that ever bloomed, all the birds that ever sang, every leaf that waved, and every tiny insect that crawled upon it, are there, none too insignificant for preservation.

There are the Indian tribes that have roamed over the face of this continent for ages, hunting buffalo on the plains, spearing fish in the waters, and shooting with their stone-pointed arrows the deer in the woods. The Aztecs with their bloody religious orgies, the milder Toltecs that preceded them, and formed settlements from Mexico to Lake Superior, where they mined for copper more than a thousand

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years before a Spaniard set foot upon the land, — all are there, — every tool they fabricated, every movement they executed, every word that fell from their lips.

There are Egypt and her millions, that toiled for ages to chisel out her labyrinthine tombs and rear her lofty pyramids; all the hordes that Asia sent in wave after wave from her central grassy plains to woody Europe, where they dispossessed the dark-skinned occupants, and seized their lands by the right of the strongest.

And what thus exists we can come into direct relation with. We can see the mountains, and watch the rivers run; dive to the bottom of the old Silurian oceans, and mark their ancient tenants; roam with the old Indians, sail in their canoes, and lie in their wigwams; hear the thud of the stone hammer on the copper gad in ancient mines of Superior; and know the absolute facts regarding a past that seemed lost to us forever.

By psychometry there is scarcely any thing but we can learn, and by a process so much easier and more delightful than our present cumbrous methods. A personal relic of Shakspeare may in half an hour reveal more of him than his biographers have been able to dig up by dint of the severest application for two hundred years. A pebble from the streets of Jerusalem is a library containing the records of the whole Jewish nation. I have known a little dust from a copper knife reveal to a boy the story of the ancient copper-miners of Lake Superior to the very life, as far as their story is known, and, I

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have no doubt, — from its harmony with itself, with the times, and with the statements of independent psychometers, — true to the very letter where it was otherwise unknown. The most secret deeds of even the most ancient times lie in the light of the brightest sunshine; and we have only to open our spiritual eyes to discover them.

History is to be vastly enlarged, and made much more reliable. The histories of many nations of which we have never heard or dreamed are to be written, and the histories of all others to be rewritten, that fact may take the place of the fables that have been for so long palmed upon mankind. With a fragment from Egypt no larger than a pea, we can learn more of the Pharaonic times than if all the hieroglyphics that were ever made were in our possession, and Champollion and Lepsius had bequeathed to us their Egyptian lore. A piece of a Babylonish brick can call up the ancient dwellers by the Euphrates, and make real as the life of to-day that of Assyria four thousand years ago.

Psychometry must greatly enlarge the boundaries of every science. Scientific men will at first look upon it with great distrust, if not with absolute disgust. All royal roads to learning have, say they, only proved by-paths for idlers to loiter in, without enabling them to gain one step toward any desirable station. Will psychometry prove any better? It certainly will; and a test, by any unprejudiced scientist, of some one of the multitude of sensitives that exist everywhere, would soon satisfy even the most sceptical. I have tested its value in geology during many years. When

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the oil excitement broke out in Pennsylvania, Mrs. Denton psychometrized a specimen of *Favosites Gothlandica* containing petroleum in its cells, and saw at once its animal origin, and that it had no necessary connection with coal or carboniferous beds. This I announced in my lectures and through the papers as early as 1860, at a time when, as far as I could learn, all scientists who had written and were writing upon the subject attributed its origin to vegetable matter, and generally taught its necessary connection with carboniferous beds, — ideas now entirely exploded. Though petroleum is not yet regarded as the product of coral-polyps, who stored it away in those cells so frequently found supplied with it even now, opinions with regard to its origin approach nearer and nearer to the view of the psychometer as the matter becomes better understood. Hundreds of times I have had psychometers describe to me, from various specimens entirely unknown to them, scenes in the earth's past history in harmony with the formations to which the specimens belonged. The same animals and plants have been described over and over again from specimens, also unknown, that had been previously seen by the same persons with specimens from the same period. I have had independent pyschometers describe the same animals and plants with the same specimens, without knowing that they were the same, and, in some cases, animals previously entirely unknown; and I am satisfied that some psychometers can see as clearly the forms of life that existed on this planet twenty million years ago as they can those that are on the globe

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to-day, and with much greater ease. Persons who have not the slightest geological knowledge can see and describe forms known only to the geologist; and children can solve some problems in a few minutes that have occupied the attention of professors for years.

In astronomy, psychometry will do as much as in geology, or more. A first-class telescope cannot be had for less than ten thousand dollars. The labor of a working-man's lifetime would hardly buy one; and, when bought, he could but faintly discern the outlines of land and water on a planet as distant as Mars. Tens of thousands possess telescopes as much better than that as sunshine is brighter than candle-light: all they need is a knowledge of their own powers, and a little instruction in the way to make use of them. With these telescopes they can not only see the outlines of land and water, but they can see water, rocks, plants, homes, and people, and watch those people as they follow their daily avocations. A telescope only enables us to see; but the spiritual faculties enable their possessors to hear, smell, taste, and feel, and become, for the time being, almost inhabitants of the planet they are examining. The secrets of our solar system, that scientists have sought so earnestly to penetrate, are soon to be revealed; and the process by which this is to be accomplished is such a simple one, it seems amazing that we had not previously discovered it.

It must not be imagined that all this can be done without close investigation and careful discrimination. It is quite interesting to watch the progress of a psy-

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chometer when getting at the history of a specimen that is familiar to the listener; to see theory after theory thrown down as more and more light is revealed by the psychometric vision. I have known a psychometer to remain in the dark in reference to some important point after even five or six examinations; and where the objects examined are such that we cannot check the statements of the psychometer, or only by the statements of other psychometers, the greatest caution is necessary. For some examinations it is best that the psychometer should know nothing about the history desired from the specimen; but, in most cases, the more highly cultured the psychometer is, the better and more reliable the results. Had Sherman the knowledge of comparative anatomy possessed by Owen of England, or of botany that Gray of America has, his descriptions would be almost infinitely superior to what they are now, and carry conviction, by their harmony with known facts, to the minds of the most sceptical capable of appreciating them.

The parties experimenting need a good knowledge of the times to which the specimen is related, or they may think a psychometer very wide of the mark when his descriptions are the very truth. Many statements given in this volume I only discovered to be true after careful examinations of authorities; and many things stated, that I regarded at the time as extremely improbable, proved to be in complete harmony with known facts.

Psychometry will enable us to appreciate a class of people who have never yet had justice done to them:

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I refer to the sensitives, the "odd people" of the world, who see what no one else can discern; who dislike persons and places, though their friends may be perfectly satisfied with them, and can give no reason for their dislike. Some of them feel uncomfortable in a railway-carriage unless close to an open window, and are liable to faint in churches or crowded halls. Some cannot sleep well unless their heads are to the north; and copper or brass affects them unpleasantly. Such people are endowed by nature with a more active condition of the spiritual faculties; and they can, as a general thing, readily develop into good psychometers, who will, before long, fill a very prominent place in the intellectual advancement of the race. The lunatic asylum has imprisoned some of the best of these, in consequence of their extreme sensitiveness, who, by judicious treatment, might have been the noblest pioneers of science.

Woman, who is by nature much more sensitive than man, and who derives, often unwittingly, much knowledge by the exercise of her spiritual faculties, is to be greatly benefited by a knowledge of psychometry. Instead of spending her time in writing or reading caricatures of human nature, such as are nineteen-twentieths of our popular novels, she can read and write true histories of men and women, tracing the most noted characters of the past, rapidly or slowly, as she pleases, through every event of their lives, see and read the documents they have written, and hear the very words that fell from their lips. What fiction can equal such true stories as these? From experiments that I have tried, I am satisfied that many of

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them might go back from living individuals, step by step, into the past, along the line of either parent, and give a true description of their ancestors for thousands of years. Indeed, I know of no limit to this power.

The cultivation of the psychometric powers will aid materially, I think, in weakening the influence of the animal passions, and bringing the individual under the control of the moral and spiritual faculties. The passions may be gratified till the individual descends to the level of them, and the brute is master of the man; or the spiritual may be cultivated till it holds the reins, and guides the individual only where it is for his highest interest to travel. The habitual exercise of these highest powers allies us to the pure and good, and helps to bring about that better time for humanity that we all desire so much to see.

Psychometry will shed much light upon the spiritual nature of man. Every successful psychometric experiment is a revelation of its wondrous powers. I sometimes listen with breathless awe to the statements of psychometers as they unravel the profoundest mysteries of Nature; and I see that we possess powers that we have hitherto considered the exclusive property of the gods. If we could but realize what we are, we should scorn to be mean or impure. How could we, the royal children of Nature, live unworthy of our lineage and destiny?

Our destiny is also indicated by it. It cannot be that we should possess such powers as psychometry reveals, and yet these be scarcely used by one in a

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thousand. Death cannot extinguish these god-lit fires, which must burn and illumine for a future commensurate with the past that psychometry reveals. Here is a magnificent palace, on which architects have been employed for an immense period in rearing, improving, and decorating. Here are rooms fit for angels, and appliances innumerable for the comfort and happiness of those who may be fortunate enough to dwell in them. Is this built merely to be thrown down before one thousandth part of it has been occupied or used? These spiritual faculties that we possess are the evidences of the spiritual realm for which they are fitted, and where life is to be perpetuated under more favorable conditions. What the psychometer sees for an hour at a time, and with difficulty, we may be able to observe at leisure, and draw instruction from as a living volume. What a realm! — the heavens of all ages for the astronomer; all the past of our planet, and its myriad life-forms, for the geologist; all the facts of man's existence for the historian; all plants, from the fucoids, that spread their arms on the tepid seas of the primeval world, to the soaring cedars of California, for the botanist; for the artist, all the giant mountains that the rains of æons have washed away, — the bare, black precipices, seamed with white veins, that frowned above the old Devonian seas; and the cañons, eaten by the mad streams that went roaring through them, and then leaped into the ocean with a more than Niagara fall; the smoking mountains, the flaming craters, and the spouting geysers, not

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of this planet alone, but of all worlds in our system, and, it may be, of all worlds in all systems; the ever-growing soul finding unlimited time and an ever-expanding universe to gratify its unceasing desire to be, to do, and to learn.

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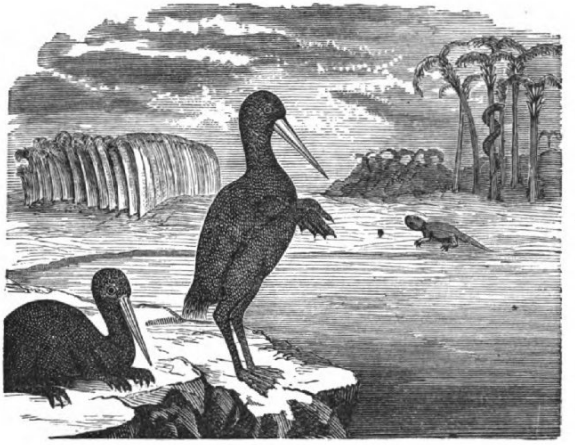
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